12-2019

Using Online Communities to Prepare Teachers to Operate as Transformative Intellectuals

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UNIVERSITY OF NORTHERN COLORADO

Greeley, Colorado

The Graduate School

USING ONLINE COMMUNITIES TO PREPARE TEACHERS TO OPERATE AS TRANSFORMATIVE INTELLECTUALS

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Education

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College of Education and Behavioral Sciences
School of Teacher Education
Educational Studies

December 2019

This Dissertation by: Zachary Morgan Clancy

Entitled: *Using Online Communities to Prepare Teachers to Operate as Transformative Intellectuals.*

has been approved as meeting the requirement for the Degree of Doctor of Education in the College of Education and Behavioral Sciences in School of Teacher Education in Program of Educational Studies.

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ABSTRACT

Clancy, Zachary, M., *Using Online Communities to Prepare Teachers to Operate as Transformative Intellectuals.* Published Doctor of Education dissertation, University of Northern Colorado, 2019.

Online communities have the potential to help teacher education programs inform and prepare future teachers to teach children equitably and confront social injustices. Online communities of scholars, activists, and artists can be used as a resource for teacher educators to prepare teacher-candidates and in-service teachers to participate in teacher inquiry and practitioner research. In turn, the research that they generate can be used by preservice and in-service teachers in the future. Online communities can also be used by classroom teachers as a form of professional development. My study included six participants – undergraduate college students, classroom teachers, and teacher-educators – from two social-justice and human-rights oriented online communities of teachers, #SaturdaySchool and #EduColor. Using observational fieldnotes, reflective journal entries, demographic survey data, interview transcripts, and archival data of past usage of the hashtags #SaturdaySchool and #EduColor during weekly Twitter teach-ins and monthly Twitter chats, respectively speaking. Findings for this study's first research question describe the values/beliefs and behaviors shared within each community and across both communities. Using archival data from Twitter and other social media platforms as well as demography survey data, this study's second research question

examined the roles of non-human entities within online places by examining usage of individual hashtags, a weekly Twitter teach-in, and the online communities #SaturdaySchool and #EduColor. The findings of this study could be useful for many grade-school classroom teachers, teacher educators and teacher education programs, teacher professional development programs, curriculum developers, and designers of educational innovation. This study sought to improve the understanding of online communities of practice, in general, by examining the roles of the digital information and communication technologies that mediate them.

ACKNOWLEDGMENTS

Thanking everyone, by name, who has assisted and helped me on my journey to completing my doctorate would require more page space than the rest of my dissertation. With that said, I would like to acknowledge those who have impacted me significantly.

I couldn't have gotten where I am without support in my personal life. First and foremost, I'd like to thank my parents, Gaye and Dan, for the support that they've provided me, especially, throughout my time as a student of higher education. I couldn't have done it without Annie, my 10-year-old Cavalier King Charles Spaniel. She's my snoring study buddy and a (usually) welcomed source of distraction when I needed to take a break from my studies. I'd also like to thank my good friend Kim. She's Annie's human mom and she's been a source of support in my educational endeavors since I was an undergraduate. In addition, I need to acknowledge one of my main sources of assistance in my personal life during my doctoral program. When I was at a point in my doctoral program where I was suffering from a work-life imbalance, I met someone who provided me with emotional support that I needed to thrive while completing my coursework. Our time together was short, but Carrie recognized my then-unnoticed fondness of podcasts and encouraged me to make one of my own, which put me on the path that led me to discover my dissertation topic. I'm also grateful for my friend and former co-worker Brittany. She supported my decision to apply for this doctoral program

and spent a weekend of her time helping me write, edit, and revise the writing samples that I included in my doctoral program application.

I'm more than somewhat embarrassed to say that I almost forgot to include her, but I absolutely need to give a shout out to my "Dude", Erin, who has been my friend since day one of first grade. You recognized my punk rock ethos long before I did, encouraged my embrace of it, and helped me recognize its intellectual position within my worldview (#punko).

Professionally speaking, I am forever indebted to two people: the late Dr. Barbara Vedder, aka "The Orange Lady", who was the director of Silverman Village, the summer camp at which I worked in my late teens and early twenties. The second person is David Brassfield, who ran S.T.E.P.S. Inc, an outdoor adventure education company at which I worked during my early college years. They both profoundly influenced my personal life as well as my educational practice and philosophy. While at Silverman and S.T.E.PS., I first discovered my fondness for education. Barb and Dave recognized my knack for educating others, encouraged me to continue doing it, gave me constructive criticism when I needed it, (strongly considered firing me on at least one occasion), and provided me with opportunities to challenge myself, and develop and grow my practice as an educator. Dave first introduced me to the idea that a person shouldn't let their schooling get in the way of their education. While behaviors that were founded on this belief may have extended the amount of time that I spent as a student in higher education, it also helped shape my decisions that contributed to me taking advantage of a last-minute opportunity to "go outside" for the weekend. Doing so also helped put me on the path to figure out my dissertation topic. My professional acknowledgements would be

incomplete if I didn't recognize the profound influence of my co-workers and my campers at Silverman Village. I also want to give a shout out to my fellow members who were a part of "Cabin 8". It was arguably my first time being involved in the establishment of a community of critical educators. I'm grateful for the constant encouragement and support that I've received from my Grizzly family at the Bruce Randolph School over the past six years that I've been working on my doctoral degree.

I would be remised if I did not acknowledge the contributions of my study's participants as well as all the other great people at #SaturdaySchool and #EduColor who have been doing the work for years. I hope my research has amplified, and will continue to amplify, your signal. I hope to continue to collaborate with you all.

Academically speaking, I owe a debt of gratitude for all the advice, feedback, suggestions, and recommendations I received from my committee chair and academic advisor, Dr. Heng-Yu Ku. I'd also like to thank my committee members, Dr. Valerie Middleton, Dr. Dana Walker, and Dr. Anna Ursyn. I'd also like to thank the colleagues who I met in my master's program. Our solidarity during our shared struggles helped prepare me for the demands or my doctoral program. I'm also indebted to my fellow "angry giraffes" in my doctoral program. I have the fondest memories of our summer seminars at the Loveland campus. Our discussions and collaborative endeavors during our coursework profoundly shaped my approach to and understanding of education. Our program might be coming to an end, but I hope that we continue to collaborate with other in future academic endeavors!

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CHAPTER I

INTRODUCTION

Online communities have the potential to help teacher education programs inform and prepare future teachers to teach children equitably and confront social injustices. Online communities of scholars, activists, and artists can be used as a resource for teacher educators to prepare teacher-candidates and in-service teachers to participate in teacher inquiry and practitioner research. Their research can be accessed by other teacher educators as well as preservice and in-service teachers who operate as transformative intellectuals in order to teach children equitably and in a way that will seek to address larger social issues that cause inequalities and injustices.

Many of the themes of teacher inquiry and practitioner research identified by Cochran-Smith and Lytle (2009) relate to the use of community as a resource for teacher inquiry and practitioner research, among both communities of teachers and teacher educators as well as those categorized as people from socially marginalized groups, and/or activist communities in online or physical settings. The types of communities in the latter category have been used as a resource in inquiry-based research to understand and address issues related to equity, engagement, and agency; growth and innovation within inquiry communities; and to shape educational reform and policy at the school and district level.

Purpose of Study

Demographic Trends

Teacher education has been impacted by demographic shifts that occurred over the past half century. After the *Brown v. Board of Education* decision, the Civil Rights movement, struggles for ethnic/women's studies programs and multicultural/bilingual education, and school bussing to counteract de facto residential segregation happened; backlash resulted in reforms pertaining to school vouchers, charter schools, and schools of choice which have essentially allowed schools to become segregated again, or (in some urban and ostensibly liberal areas like Boston, Chicago, Denver, and Detroit) simply avoid racial integration altogether.

While No Child Left Behind was supposed to "benefit all limited English proficient students", it brought an end to the Bilingual Education Act, which had required programs in schools to focus on "putting structures and programming in place to provide language learning" to support English language learners (ELL) so that they could access curricular content while acquiring English language skills (Menken, 2010, p. 2), by literally removing the term "bilingual education" from federal law (U.S. Department of Education, 2004, n.p.). The Bilingual Education Act focused on equity of opportunity in education. No Child Left Behind (NCLB), instead, also shifted emphasis to competitive academic outcome. It did so by requiring ELL students to "meet the same high academic standards as" native English speakers (U.S. Department of Education, 2004, n.p.). Therefore, ELL students were required to take English language high-stakes tests in content areas such as mathematics, science, and social studies, in addition to the English language proficiency test.

While it is not possible to separate language proficiency from content knowledge on these types of assessments, in this circumstance ELL students were expected to be as proficient at the high-stakes test as their native English speaking peers (Menken, 2010, p. 3). It seems that English language proficiency among ELL students was somehow taken as a given. This follows a pattern identified by critical language policy, where policies of this nature operate as a "mechanism of power that marginalizes some languages and their users…while advancing others" (Johnson & Johnson, 2015, p. 93). In this instance, federal legislation went from acknowledging educational inequalities experienced by ELL students, to exacerbating inequality by marginalizing non-native English speakers.

NCLB was supposed to close the racial achievement gap. However, the emphasis it placed on reading and mathematics contributed to over seven out of every ten school districts in the country cutting at least one subject to make more time for two aforementioned content areas. It resulted in the end of ethnic studies, social studies, and sciences programs. Doing so ushered in curricula and academic standards that place value in the social contributions of Western, often male, middle and upper class people, while downplaying or ignoring the contributions of others. When "multicultural, anti-racist perspectives and content are not included in standards and do not make it into school curricula" (Au, 2009, p. 66), it results in a lack of culturally relevancy for many students of color and results in a loss of interest and potential disengagement from schooling.

High-stakes testing does not assess multicultural content. As a result, multicultural content is not included in schools' curricula. This results in students of color being less engaged as the curricula are "not grounded in [their] lives" (Au, 2013, p. 81). Therefore, young African Americans do not see characters similar to themselves in works

discussed in literacy and/or social studies classes and lose interest in school (Kirkland, 2011). Young African American women had similar experiences with lack of interest in high-school physical education classes (Ennis, 1999). When students become "disengaged" or lose interest in school, they are often labeled "at risk", subjected to educational intervention and sometimes secluded in special education, before ultimately dropping out of school. Positing a causal relationship between student disengagement and the cessation of schooling before graduation is supported by a considerable amount of educational research pertaining to the issue (e.g., Lessard et al., 2008; Pellerin, 2005; Stinson, 2006).

Much like school of choice, emphasis on high-stakes testing has negatively impacted low-income students. While a disproportionate number of students from low-income schools and neighborhoods are also students of color, in this instance students from low-income families are all more likely to be negatively affected, regardless of race. This is due to a lack of educational resources such as textbooks, computers, and access to adequate internet bandwidth. Many states use entirely computer based standardized tests, which assumes that *all* students have a level of digital literacy which is common among more affluent students, but less prevalent among students from low-income families and/or in low-income schools. In a situation similar to what ELL students experience, low-income students are being assessed on content knowledge in myriad subjects in a way that assumes that they have a type of literacy that they do not possess. Low-income schools are further disadvantaged by the fact that many of the companies that produce high-stakes tests also sell textbooks that are aligned to the standards that guide the test and that oftentimes include sample questions that are markedly similar to the ones on the

test. However, these textbooks are often too expensive for low-income schools to be able to afford (Broussard, 2014).

Schools in low income neighborhoods experience two forms of systemic inequality. First, students in schools in low income neighborhoods are required to take the same standardized assessments as students at more affluent schools, even though their schools have fewer educational resources than more affluent schools. Additionally, schools in low income neighborhoods are disadvantaged because teachers are evaluated, at least in part, based on their students' scores on standardized assessments. Lower student assessment scores negatively impact teachers' evaluations. This creates incentives for teachers working at low income schools to seek positions at more affluent schools. These methods of assessment that disadvantage people from social groups that are already marginalized can be viewed as a means by which the new middle class retains a disproportionate amount of scarce educational resources by making it more difficult for less affluent, non-English speaking, non-White students to achieve educational success (Au, 2009).

While this was occurring, U.S. student populations were becoming increasingly diverse. While only 22% of all K-12 enrollments in U.S. schools were students of color in 1972 (National Center for Education Statistics, 2000), by 2012 virtually half, 49%, were students of color, 22% lived in poverty, and 10% were English language learners (National Center for Education Statistics, 2014). Federal legislation such as NCLB and IDEA required all teachers be prepared to teach special education students and students who are increasingly likely to be forced from a bilingual classroom into a mainstream English-only classroom in which they are expected to be as proficient in the English

language as their native-English speaking classmates. While this trend in student body diversity is projected to increase until 2025 (U.S. Census Bureau, 2008), teachers are overwhelmingly White and from middle-class, suburban or rural, monolingual, native-English speaking backgrounds. These socio-economic differences disadvantage students from marginalized social groups and create obstacles that teacher-education programs must confront in order to prepare future educators to teach equitably.

Ideological and Intellectual Trends

The aforementioned policy shifts occurred in conjunction with another trend related to ideological shifts pertaining to how people should learn in relation to the economy. In order to make the U.S. more competitive in the global marketplace, schools could no longer prepare students to be workers in a manufacturing-oriented and industrially based world, instead U.S. schools were supposed to begin preparing students for a "new knowledge-oriented and technologically based world" (Cochran-Smith, Villegas et al., 2016. p. 444).

Additionally, changing understandings of *how* people learned shifted from banking models of education that viewed knowledge as something that is transferred from teacher-as-knower to student-as-learner to a view that learning should "expand or reconfigure preexisting understanding by engaging students "in meaningful problem-solving activities" and "organizing communities of learners to maximize access to support" (Cochran-Smith, Villegas et al., 2016, p. 444). However, some teacher-education programs ignore this shift and emphasize teacher-candidates' knowledge of subject-matter knowledge, instead of emphasizing pedagogical knowledge or educational foundations, by operating from a point of view that sees teacher education as the

"acquisition of basic technical skills (e.g., managing students in a classroom), which were easily developed on the job after minimal initial orientation to teaching" (Cochran-Smith, Villegas et al., 2016, p. 445), in a manner similar to an entry-level position in the retail or service sector.

NCLB was supposed to improve the United States' global competitiveness, which was to be realized and verified by way of an overall improvement in national test scores in reading and mathematics, compared to past U.S. scores and current global scores. Yet, after NCLB went into effect, U.S. scores on Program for International Student Assessment (PISA) tests declined in mathematics and reading both in terms of relative global ranking and in absolute test scores from previous years (Organization for Economic Co-operation and Development, 2014).

In the aftermath of *A Nation at Risk*, reforms have deskilled and devalued teachers as professionals (Giroux, 1988). Current emphasis on high stakes testing and accountability has stripped teachers of curricular control and turned professional development into a scripted farce where teachers learn via rote memorization. Teachers receive professional development training and are evaluated with assessment scores aligned with standards and curricula that are based on stripped down "back to basics" education.

Research Questions

This study addressed two research questions.

Q1 What are the shared values/beliefs and behaviors of K-12 classroom teachers who operate as transformative intellectuals in online places?

Q2 What role do non-human actors play in sustaining the systems or networks that comprise the online places in which teachers operate as transformative intellectuals?

Significance of Study

Online communities of practice (oCoPs) tend to be user-driven and while participants "may share similar interests, their goals and motives for participation are not as defined and clear as in professional or institutional communities" (Salavuo, 2006, p. 255), and are mediated by networks of digital information and communication technologies (ICTs), which is an umbrella term for various types of technologies used for communicating and/or locating information that can be done via audio-visual, telephone, or computer networks. oCoPs that are mediated by ICTs are utilized for online teach-ins and Twitter chats, and have the potential to facilitate much-needed social change. However, they have not been fully explored in educational research due to approaches that do not fully encompass the intricacies of these online communities and the technological networks that sustain them for four reasons that are explained below.

Four Unexplored Aspects of the Existing Literature

In an educational climate where teachers are often required to go to mandatory professional development sessions that are reminiscent of "drill and kill" classroom instruction, the mere act of turning to outside sources of information for knowledge and resources to foster professional growth could be seen as a challenge to the status quo, an act which is inherently critical in nature. However, it seems that existing literature does not fully emphasize and/or explore the potentially critical nature of these types of communities. While there are online communities of teachers that seem to be operating as transformative intellectuals, there appears to be little educational research about online communities of practice that frame the community participants as being transformative intellectuals.

Secondly, educational research addressing communities of practice (CoPs) tends to look at communities based on grade level or content area. While many teacher CoPs that are online are arranged in one of the two aforementioned manners, it is not representative of *all* online CoPs and numerous instances exist in which this arrangement could be somewhat irrelevant to teachers' needs. Consider a hypothetical seventh grade science teacher who has a new student from a nation in western Africa. Consulting other seventh grade teachers would only be useful if one of them had also had a student from the same nation. The same could be said of other science teachers. However, other teachers who have taught students from the same nation might be able to provide insight into cultural differences, regardless of the content area or grade level that they taught.

Thirdly, much educational research focuses on CoPs from the perspective of a single communication platform (such as Facebook, Twitter, or third-party websites). Research focusing on multiple platforms tends to explore communities that are based on content area or grade level. In order to fully understand the technological terrain of online CoPs, it is helpful to consider how people use digital ICTs. A person could be on their phone searching their Twitter feed for information pertaining to a specific topic. They could find a link to a YouTube video that they then watch on a device with a larger screen such as a tablet computer. They could then use a laptop computer with a full QWERTY keyboard to type a long-form response to the video; then, share the link to the video and their response to the video over Facebook to a group of users that shares interest in the topic covered in the video. The topic could be anything from educational inquiry, to classic cars, to vegan cuisine, to cat videos. The person might send a friend a text message or call them over Skype to ask if they have seen the video yet. If their friend

did not notice the video link on Facebook, then the person could email it to them. While people use myriad digital ICTs to mediate a seamless network of communication and interaction, educational research often fails to approach CoPs from this perspective.

Lastly, existing educational research addresses online CoPs that arose as the result of a workshops, seminars, or professional development that began in face-to-face physical settings. However, little existing research has addressed communities that were "born" online. As Wenger (1998) points out, CoPs are so ubiquitous that they are often taken as a given. CoPs are born online frequently yet ignored routinely. As an example, on the microblogging website Twitter, users can include hashtags in their messages, which are comprised of a pound sign (#) followed by a series of words, that can be either uppercase or lowercase, or words and numbers but cannot begin with a number or be only numbers and cannot contain spaces or symbols. Other users can search for messages containing that hashtag and respond by posting their own message containing the aforementioned hashtag, for which others can search. Hashtags can be included in responses to previously posted messages and ad-hoc communities can arise around them. When this occurs on a large enough scale, Twitter refers to it as a "trending" hashtag which is prominently displayed on Twitter and other social media sites. While these types of fluid CoPs are constantly being born online, very little educational research addresses them as a type of online community.

My study provided insight into a potentially powerful practice that could be used to improve the quality of classroom teaching, teacher professional development, and the role of schools and teachers in society by gaining a better understanding into how communities of critically reflective teachers operate as a shared culture. The findings of

this study could be useful for many K-12 teachers curriculum developers, and designers of educational innovation.

Inquiry and Research

According to Cochran-Smith and Lytle (2009), recent teacher inquiry and practitioner research has addressed five themes: “the emphasis on issues of equity, engagement, and agency”; “the development of new conceptual frameworks”; “the continued growth and reinvention of inquiry communities”; “the use of practitioner research to shape school and district reform and educational policy”; and “the persistence of efforts to alter the relationship of research and practice in universities” (p. 11). Most, if not all, of these themes could be addressed in online communities of transformative teachers and activists, and artists.

Addressing power and oppression in online places. While some research into teacher-education programs treat communities as a resource to inform the practice of classroom teachers who strive to confront neoliberal policies and teach children equitably (Koerner & Abdul-Tawwab, 2006; Shirley et al., 2006), other programs have utilized “community knowledge, goals, and perspectives on education” to inform liberatory research (King, 2008, p. 1120). While the latter type of approach strives to have community stakeholders function as “full-fledged partners in ongoing collaborative practice-based community-mediated inquiry” (King, 2008, p. 1120), both take place in physical, face-to-face settings, and neither frame teachers as operating in a way that is transformative. Ukpokodu (2007) has examined teacher-education programs using the community as a resource for transformative education and pedagogy. The study found that teacher-candidates benefited from “deepened perspectives and new understandings”,

"a new sense of responsibility", a "redefinition of [the] teaching role"; and an "emerging sense of social critique" (Ukpokodu, 2007, p. 1).

Teacher-education programs' framing of teachers-as-transformative-intellectuals is not limited to community-oriented resources from face-to-face, physical interactions. Although Groenke and Maples (2009) did not use the term, they nevertheless examine a teacher-education program that operates in conjunction with the Web Pen Pals project to explore how online chat technology can create a place in which transformative teachers can create a safe space for critical race discussions as an alternative to NCLB-aligned reading instruction that often marginalizes students from non-dominant social groups. Groenke and Maples (2009) hint at the potential of online communities as places in which teachers can operate as transformative intellectuals who understand and take action to address social inequalities while striving to teach students equitably. In also creates a safe space in which transformative teachers can have a critical ongoing discussion, share resources/information, and develop solidarity with like-minded educators.

By virtue of the inherent nature of social media, particularly the microblogging website Twitter, much of the content posted to social media is optimized for keyword internet-database searches, especially in the case of a Twitter chat or a teach-in centered around a hashtag. When this happens, it makes sense to view the collective content shared and generated during a Twitter chat and/or a teach-in as a form of crowd-sourced, self-published research that can be accessed by other teachers and teacher educators. The research generated by online teach-ins and Twitter chats is compiled and archived at other social media sites such as Pinterest.

Assumptions and Limitations

My study operated based on the assumption that critical reflection in online communities can help teachers confront social injustices and teach equitably. Critical reflection is an amalgamation of two practices: self-reflection and critical inquiry. The latter "involves the conscious consideration of the moral and ethical implications and consequences of classroom practices on students"; while the former can be seen as a logical extension of critical inquiry that also considers "the dimensions of deep examination of personal values and beliefs, embodied in the assumptions teachers make and the expectations they have for students" (Larrivee, 2000, p. 294). Therefore, critical reflection is a process by which educators not only evaluate their personal and professional systems of belief, but they also ruminate over the impact and ethical considerations of their actions.

The process exposes "beliefs, assumptions, and expectations"; has teachers examine "deeply-rooted personal attitudes concerning human nature, human potential, and human learning"; and ultimately challenges "assumptions and existing practices, thereby continuously accessing new lens to view their practice and alter their perspective" (Larrivee, 2000, p. 296). When teachers develop the practice of self-reflection, they become more aware of how they perceive and react to students" and more aware of "their unconscious ways of responding to students" (Larrivee, 2000, p. 298). Larrivee (2000) identified three essential practices of reflective practitioners: making time for reflection, becoming a perpetual problem solver, and questioning the status quo.

Given the current educational landscape of high-stakes testing and accountability based on technical proficiency in the United States, school systems are exacerbating

social inequalities while perpetuating existing ones (Au, 2009). Reforms that led to this environment have also deskilled and devalued teachers to the point that it has become difficult, if not, impossible for classroom teachers to teach multi-curricular content and/or adopt a culturally relevant pedagogy. In turn, this increases the alienation of students who are already marginalized.

By operating as transformative intellectuals, teachers could question, challenge, and change schools into institutions that are able to question, confront, and begin to address the complex economic, political, and cultural issues that cause social inequalities, while elevating the role of teachers in society. Steps in this direction could be taken via critical reflection, which is something that online CoPs are well suited to facilitate. Since my study examined a community that consists of K-12 teachers from various backgrounds, its findings were somewhat generalized, and therefore might be difficult for teachers to apply to their own experiences because they do not teach the same content area or grade level.

Definitions of Terms

Below is a list of technical terms used in this chapter and subsequent chapters. Definitions are provided to facilitate an understanding of the discussion and arguments contained in my study.

Beliefs. Beliefs can be individual and/or collective and are historically developed through cultural practices. They are specific; they are what a person holds to be true or false and/or right and wrong; and they result from judgements based on experiences (Coleman, 2018).

Community of practice. This concept refers to groups that "are formed by people who engage in a process of collective learning in a shared domain of human endeavor"; it has three fundamental characteristics: "an identity defined by a shared domain of interest"; community, or "members [who] engage in joint activities and discussions, help each other, and share information"; and a the development of "a shared repertoire of resources: experiences, stories, tools," and other "ways of addressing recurring problems" (Wenger-Trayner & Wenger-Trayner, 2015, n.p.).

Critical reflection. This refers to an amalgamation of two practices: self-reflection and critical inquiry. The latter "involves the conscious consideration of the moral and ethical implications and consequences of classroom practices on students"; while the former can be seen as a logical extension of critical inquiry that also considers "the dimensions of deep examination of personal values and beliefs, embodied in the assumptions teachers make and the expectations they have for students" (Larrivee, 2000, p. 294). Giroux (1988) refers to this practice as the embodiment of teachers operating as transformative intellectuals and identifies the potential social role that teachers could occupy; however, he does not provide extensive explanation of how to achieve those ends. Nevertheless, one way of realizing Giroux's vision is to transform the practice of teaching by encouraging critical reflection among educators. Framing the argument in terms of oppressed and systemically disadvantaged students, Larrivee (2000) presents critical reflection as a means to "combat increasing student alienation" by developing "authentic learning communities by adjusting the power dynamics to turn power *over* into power *with* learners" (p. 293).

Culturally relevant pedagogy. It "serves to empower students to the point where they will be able to examine critically educational content and process and ask what its role is in creating a truly democratic and multicultural society"; in addition, "[i]t uses the students' culture to help them create meaning and understand the world" (Ladson-Billings, 1992, p. 106).

Cybernetic ecosystems. The notion that people are one part of an ecosystem comprised of living and non-living entities, and calls into question the distinction between human and unhuman.

Funds of knowledge. Funds of knowledge are "knowledge and skills gained through historical and cultural interactions that are essential for individuals to have if they are to function appropriately within their communities", and while they "may be more particular to a family within the context of a community", they also include "include knowledge, action, and disposition or habits, with the recognition of how each of these domains is culturally constructed and refined" (Rohandi & Zain, 2011, p. 303).

Information and communication technologies (ICTs). This is an umbrella term for all forms of technologies used for communicating and/or locating information that can be done via audio-visual, telephone, or computer networks.

Multicultural education. Multicultural education is a curricular theory that strives to create educational environments where "students who are members of diverse racial, ethnic, language, and cultural groups will have an equal chance to achieve academically" (Banks & Banks, 2010, p. 1).

Online communities of practice (oCoPs). oCoPs tend to be user-driven and while participants "may share similar interests, their goals and motives for participation

are not as defined and clear as in professional or institutional communities" (Salavuo, 2006, p. 255).

Teach-in. For the purpose of my study, teach-in referred to communal activities occurring over Twitter. During teach-ins, one person assumes a limited leadership role by selecting the weekly topic of discussion, sharing relevant materials, and possibly asking other participants questions related to the material that they posted and/or comments that they have made. Discussions typically last for a week, but peak hours of user interactions are usually between on Saturday between 6 a.m. and 10 a.m. mountain time. For the purpose of this study, I focused on teach-ins occurring in the #SaturdaySchool community.

Twitter chat. For the purpose of my study, a Twitter chat refers to communal activities occurring online. Prior to a Twitter chat, one or two moderators will either create a list of approximately ten questions pertaining to the chat's theme or will be given a list of questions. During the Twitter chat, moderators will pose the questions to participants. Responses tend to be mostly text based. However, at times participants will also share relevant research such as a journal article or an education website related to the chat's theme. During Twitter chats, it is common for moderators to ask participants probing follow-up questions. In the case of the #EduColor community, Twitter chats typically occur monthly and each chat lasts approximately one hour.

Situated learning. Situated learning is based on the understanding that "knowing is inseparable from doing, and all knowledge is situated in activities bound to physical, social, and cultural contexts; learning should be presented in authentic contexts where

learners would actively understand and use their learning (Spector, Merrill, Elen, & Bishop, 2014, p. 962).

Social media. For the purpose of this study, social media was defined as digital communication platforms that facilitate the creation and sharing of user-generated content.

Transformative intellectuals. Teachers who "take responsibility for raising serious questions about what they teach, how they are to teach, and what the larger goals are for which they are striving" (Giroux, 1988, p. 126).**.** While devaluing and deskilling of teachers has been in part facilitated by recent educational reforms, critical theorists noted this trend decades ago (Apple, 2013; Giroux, 1988). One solution is for teachers to operate as transformative intellectuals who "take a responsible role in shaping the purposes and conditions of schooling" by questioning what has prevented schools and teachers from realizing their full potential, "view[ing] schools as economic, cultural and social sites that are inextricably tied to issues of power and control", and "develop[ing] a discourse that unites the language of critique" as well as "the language of possibility so that social educators recognize that they can make changes" (Giroux, 1988, p. 210-211).

Values. Values have a sociocultural and historical dimension, develop over time about "desirable goals or modes of conduct that will lead to the attainment of these goals", are hierarchical, ask "what is the good life?", and are the basis of behavior and motivation (Fischer, 2018).

Viable system. A viable system refers to the "internal organization and the various functions" within systems or networks "that allow them to maintain operations and adapt to a changing environment" (Johnson & Leydesdorff, 2015, p. 269).

Summary

Online communities can benefit pre-service teachers. Teachers can learn to operate as transformative intellectuals who understand and attempt to confront social injustices. They can learn to teach children equitably and strive to address the root causes of social inequalities and injustices. These online communities have many of the hallmark themes of teacher inquiry and practitioner research. Teacher education programs that incorporate these types of communities into teacher preparation courses could help demarginalize currently existing, collaboratively conducted, self-published teacher inquiry/practitioner research that is being generated by online communities of teacher educators, preservice and in-service teachers, people from marginalized social groups, activists, and scholars. Online communities can also benefit classroom teachers by providing a space for critical reflection. Additionally, this practice allows teachers to access the educational materials necessary to operate as transformative intellectuals.

CHAPTER II

REVIEW OF LITERATURE

The first section of this literature review addresses classroom teachers' learning environments. In the second section, I address literature related to teacher education, teacher inquiry, and practitioner research. In the third section, I provide a brief explanation of the viable system model, which can be seen as a model for the overall recursive format of my research questions and was the basis of my methods of data analysis for my second research question. The fourth section explores research pertaining to teachers who operate as transformative intellectuals who actively question the role of teachers, education, and society and seek to use education to address social inequalities. The fifth section provides an overview of means by which studies using ethnographic perspectives and methods have been used to gain a better understanding of shared cultures that utilize electronic devices for communicating and/or proliferating information. Actor-network theory, the methodology I used to address my first research question, is explained in the sixth and final section

Classroom Teachers' Learning Environments

Myriad conceptual and analytical frameworks exist for understanding groups of individuals who interact with each other in learning environments, occurring either formally or informally, in places that can be virtual or offline. These frameworks are not mutually exclusive as more than one could be used to accomplish some tasks and

researchers often use more than one framework to gain a better understanding of some shared cultures.

Communities of Practice

Communities of practice (CoPs) is a term coined by Etienne Wenger and/or Jean Lave (at one point, each credited the other for their co-creation) (Wenger, 1998), an anecdote that, to me, speaks in general to the collaborative nature of educational endeavors and, specifically, the collaborative nature of CoPs. The concept is based on four assumptions: that people are "social beings"; that "[k]nowledge is a matter of competence with respect to valued" endeavors and activities; that "[k]nowing is a matter of participating" in the aforementioned endeavors and activities, in other words "active engagement in the world"; and lastly, meaning, or the "ability to experience the world and our engagement with it as meaningful – is ultimately what learning is to produce" (Wenger, 1998, p. 4).

Many shared environments in which situated learning occurs and/or situated knowledge exists can be considered a CoP. However, not all communities are CoPs. A geographic space occupied by a residential neighborhood might be called a community but (unless the neighborhood is for instance a tightly knit ethnic enclave in which the social reproduction of shared cultural heritage could be considered the focus of a community of practice) it is most likely not a CoP. Communities of practice have three fundamental aspects: the domain, the community, and the practice. The first aspect is a "shared domain of interest" as well an implied "commitment to the domain", and, as a result, a "shared competence that distinguishes members from other people"; the second aspect pertains to the pursuit in which "members engage in joint activities and

discussions, help each other, and share information"; the third and final aspect refers to a "shared repertoire of resources: experiences, stories, tools, [and] ways of addressing recurring problems" (Wenger-Trayner & Wenger-Trayner, 2015, n.p.).

Communities of practice have been applied to myriad shared environments in which learning occurs. Researchers have used it critically as a framework to gain insights in a community of anarchist, anticaptialist, do-it-yourself activists whose shared culture valued an "innovative alternative process of living, learning, and knowledge sharing" (Hemphill & Leskowitz, 2012, p. 57). Researches have also used CoPs to explore small-scale "microcommunities of knowledge" based at an information-technology company in New Zealand (Fletcher, 2014, p. 351).

In relation to teaching specifically, learning within CoPs occurs through "social interactions that [facilitate] the transfer of tacit knowledge" via both problem solving and storytelling, "collective reflection which enables members in the community to conceptualize and learn from each other's experiences and insights", and lastly via "the collection process of collaborative learning and sharing, explicit knowledge is created with collective learning outcomes" (Hung, Lee, & Vishnumahanti, 2014, p. 141).

Given the ways in which teachers participate in them, it is not surprising that much research pertaining to CoPs and teachers often relates to professional development (Cuddapah & Clayton, 2011; Hartnell-Young, 2006; Hung et al., 2014). While some teacher-oriented research addresses digital information and communication technologies (Hartnell-Young, 2006; Hung et al., 2014), not all of it does (Cuddapah & Clayton, 2011), and a separate term exists for CoPs that occur in online places, online communities of practice (oCoPs). oCoPs tend to be user-driven and while participants

"may share similar interests, their goals and motives for participation are not as defined and clear as in professional or institutional communities" (Salavuo, 2006, p. 255).

Online Communities of Practice

Although used to frame issues ranging from music-sharing communities (Salavuo, 2006) to anarchist activists (Hemphill & Leskowitz, 2012), oCoPs have also been used frequently to look at educational settings. Online communities of practice have been used extensively in research related to teacher professional development (Baran & Cagiltay, 2010; Gamrat, Zimmerman, Dudek, & Peck, 2014; Hur & Brush, 2009; Hur & Hara, 2007; Khalid, Joyes, Ellison, & Karim, 2013; Kulavuz-Onal, 2013; Tsiotakis & Jimoyiannis, 2016). Much of the research tends to focus on online communities that operate from purpose-built platforms. In other words, they operate from a website that was designed and build intentionally for a specific community (Baran & Cagiltay, 2010; Gamrat et al., 2014; Kulavuz- Onal, 2013; Nistor et al., 2014; Tsiotakis & Jimoyiannis, 2016); or researchers tend to focus on communities that relies on a single website such as a blog (Dennen, 2014), Twitter (Britt & Paulus, 2016; Davis, 2015; Wesely, 2013), or communities that are both purpose-built and single-site (Conole et al., 2011; Hur & Brush, 2009; Hur & Hara, 2007; Nett, 2008).

Some aspects of purpose-built platforms hinder their proliferation. First, these types of websites tend to have a person or persons who operate as the gatekeeper(s), unfortunately functioning as a bottleneck to stymie implementation of new technologies and digital innovations into the website as only the gatekeeper(s) can incorporate them. Second, since the website has been created prior to formation of the online community, certain aspects of the website could act as unintentional barriers to entry to some

participants, and given the bottleneck that hinders change, it might be difficult and time consuming to modify the website into a more appealing format.

Portrayals of online communities as single-site places are also problematic. By design, the Internet is not a walled garden. The advent of hypertext in the early 1990s and more recently the advent Web 2.0 technologies have made using the Internet an even-more, ever increasingly fluid process. With the single click of a web link, people can jump from one website to another with extreme ease and in rapid succession. Someone might see a YouTube video on Facebook and share it over Twitter with their community of practice via a commonly used hashtag. Someone else in the community might see the video and post it on their blog along with their written thoughts about the video. This is an example of the myriad mundane ways that many people use the Internet. Research that takes this into consideration has the potential to provide a more accurate portrayal of online communities than research that does not take it into consideration.

Some research into teachers' online communities of practice, such as Hur and Hara (2007), Khalid et al., (2013), and Kulavuz-Onal (2013), does not fall into either the purpose-built category or the single-platform category. Khalid et al. (2013) use netnographic inquiry, a method that I will be using to obtain data for my research study which required gathering information from multiple field sites.

Beyond Communities of Practice

Recently, a relatively newer approach to communities of practice, called beyond communities of practice, abbreviated as beyond-CoP, has become more prevalent in research related to social science (Barton & Tusting, 2005), management (Su, Mark, & Sutton, 2007), and education (Ferm Almquist et al., 2017). Beyond-CoP is an effort to

return the concept of communities of practice to a more critical analytical tool, by focusing on issues related to “power, resistance, and inequality” after it had begun to be overshadowed by “certainty and oversimplifications of management training” (Barton & Tusting, 2005, p. 6). In particular, the approach to communities used in this study was based around Gee’s (2005) concept of “semiotic social spaces”. My decision to use this concept was made in part because it compliments actor-network theory, which will be explained in greater detail shortly. Gee (2005) provides the example of a classroom as something commonly viewed as a community of practice, then poses a hypothetical situation with two students, one interested in engaging with the content for the sake of learning, and another student who is exerting the minimum amount of effort necessary to pass the class. It is hard to argue that both students have shared goals and values. Gee’s (2005) concept provides a way to view these two students as being what could be considered different actors in the same network.

Gee (2005) defines semiotic social spaces, which he abbreviates as SSSs, as consisting of generators, which provide “a set of signs and possible relations among them”; signs which are that to which “people organize their thoughts, beliefs, values, actions [,] and social interactions in relation”; additionally “every SSS has an ‘internal grammar’ (namely, the design of its sign and their relationships)”; as well as an “‘external grammar’ (namely, the organization of people’s thoughts, beliefs, values, actions [,] and social interactions”; in addition to portals which provide “access to signs and interactions with them” (p. 219, 221).

Computer-Supported Collaborative Learning and Computer-Mediated Communication

Computer-supported collaborative learning (CSCL) refers to educational practices in which computers are used to facilitate interactions between students in remote and/or face-to-face settings "in which interactions among peers constitute the most important factor in learning" (Dillenbourg, Järvelä, & Fischer, 2009). CSCL has been used to explore both professional and personal (as well as formal and informal) learning that occurs in online places. Not merely applied to areas such as teacher education (Remesal & Colomina, 2013), it has also been used to gain an understanding of business degree programs (Giesbers, Rienties, Tempelaar, & Gijselaers, 2014), as well as online informal learning among "adult women of gypsy origin" (Fernández & Valverde, 2014, p. 97). However, I elected not to use this approach for two reasons. Firstly, CSCL is generally used to research online learning environments that consist of a platform that was built intentionally with the purpose of facilitating learning. I want to utilize a framework that can be applied to organically occurring learning places which utilize pre-existing platforms that are used every day and in mundane ways.

Purpose-built learning environments generally have some sort of delay with regard to the implementation of new communication platforms (unless they are wiki-oriented sites that users can edit), whereas learning environments that arise from mundane use of commonplace digital technologies will be able to adopt new communication technologies (such as social media) as they arise in real time, in response to changes in the environment whether they are known or unknown, anticipated or unanticipated. Furthermore, many resources exist that explain how to use commonplace

digital technologies are available and relatively easy to access. I sought to understand groups and places where new technologies and innovations are adopted organically and in real-time because society at large adopts new technologies and innovations in a similar manner. The approach I selected also compliments the methods of data analysis used to address my second research questions and is congruent with this study's ontological, epistemological, and methodological perspectives. The second reason I have chosen not to use CSCL is because, much like computer-mediated communication (CMC), it views digital technologies as mere instruments as opposed to actor-network theory (ANT) which is based on the understanding that non-human actors have the potential for agency. ANT will be addressed in a subsequent section of this chapter. The notion of non-human agency will be addressed in the following chapter's section about my stance as a researcher.

CMC occurs in educational environments where "electronic discussion is used as a means of enhancing [learners'] exploration and understanding of the subject matter" (Prinsen, Volman, & Terwel, 2007). Researchers often use CMC to gain an understanding of online places where learning occurs. It has also been used with communities of inquiry (CoIs) (Fernández & Valverde, 2014), and communities of practice (Kulavuz-Onal, 2013). CoIs and CoPs will be explained in greater detail in a subsequent section of this chapter.

Activity Theory and Social Network Analysis

As a framework for analysis, activity theory has been used to explore places of online learning in conjunction with actor-network theory (Conole et al., 2011; Mlitwa, 2007). Activity theory is used to examine online situations based on the fundamental

assumption “that activities occur in a context and that this context needs to be taken into account if we are to make meaning of the situation and appropriately interpret the results” (Conole et al., 2011). It has also been used to analyze communities of practice (Baran & Cagiltay, 2010; Dennen, 2014). However, activity theory is not appropriate for my study as it focuses on rules, regulations, and established divisions of labor which do not appear to be overly prevalent in the types of online places which I seek to understand.

Social network analysis (SNA) is also used to analyze learning. SNA has four quintessential aspects: it is “motivated by a structural intuition based on ties linking social actors”; in addition, “[i]t is grounded in systemic empirical data”; it also “draws heavily on graphic imagery”; lastly it “relies on the use of mathematical and/or computational modes” (McCulloh, Armstrong, & Johnson, 2013). It is sometimes used with CMC and CoIs (Conole et al., 2011; Shea et al., 2010). However, to a greater extent than CSCL and CMC, social network analysis has applications outside of online places (Carmichael, Fox, McCormick, Procter, & Honour, 2006; McCulloh et al., 2013). In addition, social network analysis has been used to examine communities of practice (Conole et al., 2011; Nistor et al., 2014). However, activity theory depends, heavily in some instances, on quantitative statistical analysis, and my study, as I envision it, will not include any meaningful quantitative analysis. While it will be covered in-depth in a subsequent section of this chapter, it is worth noting that actor-network theory is a framework that is also associated with similar types of analysis as activity theory and social network analysis (Conole et al., 2011; Mlitwa, 2007).

Professional and Personal Learning

While face-to-face professional learning communities (PLCs) can be considered separate from virtual learning communities (VLCs), these concepts are not mutually exclusive as they have been used to explore both critical reflection (de Groot, van den Berg, Endedijk, van Beukelen, & Simons, 2011) and teacher learning (Hui, 2015; Lieberman & Mace, 2010) both "in and out of school" (Carmichael et al., 2006). Personal learning communities (and virtual learning communities) have three crucial aspects: "collaborative work and discussion among the school's professionals, a strong and consistent focus on teaching and learning within that collaborative work, and the collection and use of assessment and other data to inquire into and evaluate progress over time" (Giles & Hargreaves, 2006). Some research regarding virtual learning has addressed social media, in particular the microblogging website Twitter as a means of professional development for teachers (Lieberman & Mace, 2010), as does much of the literature on personal learning networks in a subsequent part of this chapter section. I chose not to utilize PLCs or VLCs as they tend to be used to initiate institutionally determined reforms and policies that might have been mandated by legislators, school boards, and/or administrators, whereas I am interested in exploring teachers who are seeking to improve professionally for reasons that could be both personal and exist in opposition to institutional policies regarding pedagogy, curriculum, professional development, and perhaps even teacher preparation.

Personal learning networks (PLNs) can occur in online and face-to-face social settings; however, those that are based on online networks are sometimes referred to as personal learning environments (Dabbagh & Kitsantas, 2012). PLNs serve four functions:

they facilitate the production and consumption of pertinent information; they build connections between like-minded educators; they allow participants to create new content from information they gleaned in the network; and the network provides participants with the chance to contribute content that can be consumed by other participants (LaGarde & Whitehead, 2012). Whether it collects data from an online perspective (Davis, 2015; Visser, Evering, & Barrett, 2014) or not (Rodesiler et al., 2014), much of the research related to teachers' PLNs is oriented toward social media-based professional development with an emphasis on the use of Twitter (Davis, 2015; LaGarde & Whitehead, 2012; Rodesiler et al., 2014; Visser et al., 2014).

While personal learning networks (McCormack, Ambler, Martin, Waite, & Wilson, 2016) and personal learning environments (Fernández & Valverde, 2014) have been used to look at communities of practice, personal learning networks are a human centered concept and, much like computer-supported collaborative learning, do not provide a meaningful role for non-human agency which in not congruous with my stance as a researcher.

Communities of Inquiry

Communities of inquiry (CoIs) are another way of exploring learning in online and offline places and, as a concept, have a background in CMC-oriented research. Per the people who coined the term, CoIs have three fundamental elements: cognitive presence, social presence, and teaching presence (Garrison, Anderson, & Archer, 2000). The first element refers to "the extent to which the participants in any particular configuration of a community of inquiry are able to construct meaning through sustained communication"; the second refers to community participants' ability to project their

personal characteristics into the community, thereby presenting themselves to the other participants as 'real people'"; the last element can be carried out by any single member of the community (but in educational settings it is likely to be the teacher) who carries out two functions by designing the educational experience via "the selection, organization, and primary presentation of course content, as well as the design and development of learning activities and assessment" and by supporting and enhancing "social and cognitive presence for the purpose of realizing educational outcomes" (Garrison et al., 2000, p. 89-90). While the type of communities that I seek to explore could, in their current form, be viewed as CoIs in the context of teacher education, it is more apropos to view these communities as a newer variation of CoPs which will be explained in a subsequent section.

While CoIs are often associated with institutional academic learning, particularly higher education (deNoyelles, Zydney, & Chen, 2014; Giesbers et al., 2014; Powell, Tindal, & Millwood, 2008), other researchers have addressed learning that occurs outside of course work (Fernández & Valverde, 2014). Some researchers have addressed teacher professional development in online places in conjunction with CoPs (as well as activity theory and ANT) (Conole et. al., 2011). Regardless, CoIs have formalized roles, specifically those who operate as teachers/facilitators and those who operate as students/learners. The types of online groups of which I seek to gain a better understanding seem to be egalitarian and have dynamic roles, shifting back and forth from learner to teacher, with little (if any) formal announcement of the change during the course of a conversation. CoIs seem to be well suited for asynchronous communication

(Giesbers et al., 2014). However, I was interested in online places where learning occurs via both synchronous and asynchronous communication.

Situated Knowledge and Activism

My study ought to explore the learning environments of transformative teachers that occurs in online places. ANT has been used to look at different aspects of the aforementioned topic. ANT has used to explore situated literacies (Burgess, 2008), situated learning (Greenhow, Robelia, & Hughes, 2009; Mulcahy, 2007;), as well as situated learning and situated literacies (Edwards, Ivanic, & Mannion, 2009; Ivanic et al., 2009). These studies also looked at reform (Greenhow et al, 2009), assessments (Burgess, 2008), standards (Edwards et al., 2009; Mulcahy, 2007), as well as curriculum and accountability (Edwards & Uster, 2009). ANT research specific to these topics is explored in greater detail in this chapter section.

In my study, I examined online places as sites of learning for transformative activist teachers. It seems that there is little ANT literature that addresses online places as sites of activism. While early-ANT, and later ANT literature did not engage in much critical analysis (Fenwick & Edwards, 2010), more recent ANT literature (which will be explored in following section of this chapter and the next chapter) could provide the means to apply critical analysis to actor-network theory as a methodology. Nevertheless, some ANT literature has addressed online places. boyd (2007) explored networked publics used almost exclusively by young people by applying ethnographic methods. Some have used ANT to explore how new digital information and communication technologies (ICTs) have impacted educational reform and educational research (Greenhow et al., 2009), while others have explored how places of online learning are

influenced by ICTs. ANT has also been used to look at the way that a seemingly banal issue such as internet connectivity impacts a person's experience in online places via a concept known as "mundane cyborg practices" (Petersen, 2007, p. 80). The concept of the cyborg will be further explored in following sections.

ANT has been used to study the online learning places of teachers (Conole et al., 2011); however, perhaps as evidence of ANT's aforementioned shortcomings of not being suited for critical analysis and as a result of a study that focuses on esoteric aspects of a particular website, the study provides little insight into how online places can be sites of activism. Nevertheless, ANT has been used to look at online places that function as a bulwark "to mitigate the disembodiment that globalization processes in education" as it relates to both ICTs and curricula (Edwards & Usher, 2007, p. 62).

Digital Information and Communication Technologies

Actor-network theory has been used extensively in conjunction with information and communication technologies (ICTs) as a framework in relation to educational research, particularly in relation to educational policy (Hussenot, 2008; Samarawickrema & Stacey, 2007), as well as curriculum (Edwards & Usher, 2007), and educational reform (Greenhow et al., 2009; Nespor, 2011).

Not merely used in educational contexts, Bruni, Gherardi, and Parolin (2007) used ANT and ICTs to look at fragmented knowledge among medical service providers. In addition to strictly educational settings, ANT and ICTs have been used to examine the role of digital technologies in educational and recreational aspects of a students' everyday life (Leander & Lovvoron, 2006). Other researchers have used ANT to research mundane

everyday ICTs use (Hargittai, 2008; Petersen, 2007). This approach was of particular significance to my study as it compliments my stance as a researcher and this study's epistemological perspective, both of which are discussed in detail in the following chapter.

Actor-network theory has been used to look at how ICTs have been utilized in teacher learning that occurs online (Conole et al., 2011), as well as offline (Carmichael et al., 2006), and education policy (Hussenot, 2008), in addition to curriculum (Harris-Heart, 2009; Ivanic et al., 2009), and general educational reform (Greenhow et al., 2009). ANT has also been used in conjunction with ICTs to examine learning environments both outside of education (Bruni et al., 2007) and within education (Greenhow et al., 2009), and in particular to explore matters pertaining to curriculum (Edwards, 2011; Edwards & Usher, 2007; Ivanic et al., 2009).

ANT research had application to my study as both it and my study have explored online places. ANT has been used in both educational contexts (Conole et al., 2011; Edwards & Usher, 2007; Greenhow et al., 2009) and in everyday contexts (boyd, 2007; Cypher & Richardson, 2006; Petersen, 2007) to research online places and online groups.

Reform and Reformers

While it is not terribly critical on its own, actor-network theory can be applied critically by, for instance, looking at activists or to critique a curriculum (e.g., Edwards, 2011; Edwards et al, 2009; Edwards & Usher, 2007; Ivanic et al, 2009). ANT has focused on knowledge as the "enactment of a concept, identity, or practice" (Fenwick & Edwards, 2010, p. 25). It has been used to examine the experiences of people from marginalized social groups who participate in prison education programs (Hunter & Swan, 2007), and

used in the past to challenge racism and colonialism (Nespor, 1994). Nespor (2002) has addressed "reformers" in a general context of change. However, not all change results in progress, and this was not necessarily especially helpful for my study, as I admonished neoliberal reforms in my introduction chapter, while at the same time at least implying that teachers operating as transformative intellectuals can be seen as a model for future activists and reformers. Fenwick and Edwards (2010), for instance, argue that students' parents are an aspect of the "school's network of reform" (p. 103), suggesting that activists (in this case, parents) can be part of reform networks and efforts.

However, ANT research oriented toward reformers has been problematic, as two critiques of early-ANT literature were that it focused on "big actors" and "centrality". In other words, it had a tendency to focus on well-known figures and people in privileged positions of authority, and it made seemingly arbitrary decisions to "cut the network" in an attempt "establish boundaries around the object of inquiry" (Fenwick & Edwards, 2012, p. 105). I attempted ameliorate the former issue by finding participants via assistance from (an) informant(s), and the latter by using the viable system model to "fold" the network in a recursive manner that negates the need for cutting.

Policy, Curriculum, Standards, Accountability and Assessment

In addition to general reform(ers), ANT has been used to explore and critique educational policy (Gorur, 2011). Researchers have also employed the theory to look at policy issues (Emad & Roth, 2009; Hamilton, 2011; Hamilton & Hillier, 2007; Hunter & Swan, 2007). ANT has also been used in relation to curriculum. While some ANT research is oriented toward the grade-school level (Bisset & Potvin, 2006), much of it is centered on higher education and vocational training (Edwards, 2011; Harris-Heart, 2009;

Ivanic et al., 2009; Miller, Edwards, & Priestley, 2010). As previously mentioned, ANT does not always lend itself to critique. However, in the case on ANT research related to curriculum, much of it pertains to critique (Bisset & Potvin, 2006; Edwards, 2011; Ivanic et al., 2009; Miller et al., 2010). Another aspect of educational studies to which ANT has been applied is standards and accountability. ANT-based research (Edwards et al., 2009; Mulcahy, 2011) seems to be lesser than the emphasis on student assessment and teacher accountability (Burgess, 2008; Edwards & Usher, 2007; Hamilton & Hillier, 2007; Webb, 2006).

Actor-Network Theory as Methodology

As previously mentioned, ANT can function as a methodology, even though it is arguably most associated with ethnographic inquiry, where it is often used as a framework or method for data collection and analysis (Burgess, 2008; Petersen, 2007). Nevertheless, ANT has been used with myriad methodologies. It has been used in conjunction with case study (Emad & Roth, 2009; Miller et al., 2010), and in conjunction with ethnographic studies and case studies (boyd, 2007; Scheeres & Solomon, 2006), as well as in longitudinal studies and mixed-methods studies (McEwan, 2008). However, ANT as its own methodology appears to be fairly prevalent in educational research (Conole et al., 2011; Gorur, 201; Leander & Lovvoron, 2006; Mulcahy, 2007, 2011; Resnik, 2006). Although it will be explained in greater detail in the following chapter, it is worth mentioning that there is an approach to actor-network theory called after-ANT that arose as a critique to ANT literature, arguing that ANT research was becoming laden with the type of formulas and a priori assumptions that it purported to eschew originally. As a result, after-ANT arose as a means by which to address fluid objects (Mulcahy,

2007) and fluid spaces (Fenwick, 2011), and multiplicities (Hunter & Swan, 2007). In addition, Gough (2004) makes a connection between after-ANT and post-humanism that compliments cyborg anthropology and cybernetic thought which are concepts that play significant roles in my stance as a researcher.

Teacher Education

Understanding and Addressing Power and Oppression

Previously mentioned studies highlight teacher-education programs that help preservice teachers gain an understanding of social and institutional constructs of power and oppression by reflecting on their unearned privilege (Mueller & O'Connor, 2007) in order to provide teacher candidates with the opportunity to "develop conceptual and practical tools" necessary to understand social injustices (McDonald, 2005, p. 418), and field experiences designed to help preservice and in-service teachers gain a better understanding of the Holocaust in a face-to-face, physical setting (Spalding et al., 2007). Not all of these types of teacher-education programs operate solely in physical settings.

Understanding power and oppression in online places. Other teacher-education programs strive toward similar goals in online settings. Hyland and Heuschkel (2010) highlight efforts by teacher-education programs to help teacher candidates gain a better understanding of institutional oppression in a course on diversity and power with an inquiry assignment that began with preservice teachers visiting "a public institution other than a school" and analyzing the experience critically before reflecting upon the analysis in a web-based discussion (p. 821). Other teacher-education programs have utilized online discussions in conjunction with "critical readings on problematic issues and inequalities in urban schools" and found that "particularly helpful scaffolds in online

discussions about field experience are tailored" to the specific conversation (Whipp, 2003, p. 321).

Not all discussions held in this type of teacher-education program are used to reflect on field experiences. Leonard and Leonard (2006) studied a teacher-education program at a public university in a small northern Louisiana city. This program utilized online discussions for students to respond to autobiographies of other students in the course. Findings suggest that during online discussions, in-service and preservice teachers "were particularly candid in reflecting" (Leonard & Leonard, 2006, p. 30). While these programs' practices strive to help teachers understand structural and institutional power and oppression, others go a step further and attempt to prepare teacher candidates to address social inequalities and injustices.

Swadener, Anquino-Sterling, Nagasawa, and Bartlet (2009) have explored efforts by an ECE teacher-education program in the southeastern United States that has helped to develop "professional development projects focused largely on preschool teachers in high poverty settings and linguistically diverse communities" (p. 99). Teach-ins, lasting two to three days at Arizona State University, functioned as "a bridge between critical pedagogy and strengthening connections between global struggles and local actions" (Swadener et al., 2009, p.105). Although some of the aforementioned programs had only loose connections to communities and community-based organizations, other teacher-education programs with emphasis on preparing teacher-candidates to understand and address social inequalities from the global to the local level rely more heavily on them.

Another approach uses communities as a resource for equity-centered teacher education programs. These types of programs have "four essential tasks: conceptualizing

educational inequality" as well as "the role of teacher education in challenging inequality"; in addition to "defining practice for equity; creating curricula and structures that are equity-centered and tailored to local patterns of inequality;" and "engaging in research for local improvement and theory building about the conditions that support candidates' equity practice" (Cochran-Smith, Ell et al., 2016, p. 67). Cochran-Smith, Ell et al., (2016) highlight a teacher-education program in New Zealand called the *Masters of Teaching-Primary Program* in which teacher-candidates experience cultural immersion in Maori communities with people who "have very different backgrounds in order to gain a better understanding of Maori knowledge, traditions, language and worldview" in order to impart the notion that diverse "ways of knowing are explicitly valued" (Cochran-Smith, Ell et al., 2016, p. 73).

Communities for equity. Cochran-Smith (2015) has also explored concepts of equity and community as it relates to in-service teachers. Referred to as "communities for equity", or "communities whose purpose is to help teachers work for equity by focusing on questions that emerge from practice and from genuine on-the-ground concerns" about how to understand and address social inequalities (Cochran-Smith, 2015, p. 110). In these communities, "the structure and purpose of the community is not imposed from above by school administrators"; rather, teachers can operate as transformative intellectuals by questioning "what is taken for granted in teaching, learning, and schooling" (Cochran-Smith, 2015, p. 113).

While the term is not used in either of the two aforementioned articles, these types of communities could be considered forms of teacher inquiry and/or practitioner research. Cochran-Smith and Lytle (2009) have identified five themes of practitioner research:

valuing an “emphasis on issues of equity, engagement, and agency”; developing “new conceptual frameworks”; continuing the “growth and reinvention of inquiry communities”; using “practitioner research to shape school and district reform and educational policies”; and persisting with “efforts to alter the relationships of research and practice in universities” (p. 11).

Efforts to address equity, engagement, and agency have been embodied in myriad foci. At the local level, the Teacher Research Collaborative operates from the San Francisco/Bay Area and was established “based on the pursuit of local answers to fundamental questions about the nature of equity, how it relates to teaching and working in schools, and the role of equity in teacher research/action research” (Cochran-Smith & Lytle, 2009, p. 14). The Philadelphia Teachers Learning Collaborative (PTLC) “exemplifies the power possibilities of local groups with national connections and national reach to support local knowledge generation” (Cochran-Smith & Lytle, 2009, p. 23).

In partnership with the National Writing Project, the Philadelphia Writing Project “convened a group of parents, teachers, and students to form a participatory inquiry group to study school reform from diverse perspectives” (Cochran-Smith & Lytle, 2009, p. 15). The Gender Awareness Through Education (GATE) project formed a community comprised of “teams of teachers, parents, and administrators engaged in practitioner inquiry to consider gender in relation to other social issues, including race, class, religion, sexual orientation, and (dis)ability” (Cochran-Smith & Lytle, 2009, p. 13). These types of communities, sometimes known as networks, also exist in online places where the notion of practitioner inquiry is being reinvented. The North American Action Research

Alliance (NAARA) facilitates interactions between activists interested in "collaborative subversion" and "the politics of social justice" (Cochran-Smith & Lytle, 2009, p. 25). Communities of teachers and/or teacher educators also exist at the national and local levels and operate in online and physical places.

Some endeavors take place at the national level, such as the National Writing Project's collaboration with the Centre for Social Action in England which sought to "merge literacy education and problem solving into [students'] schools, communities, and lives" (Cochran-Smith & Lytle, 2009, p. 15). Teacher communities, such as the Primary English Teachers Association (PETA), the American Educational Research Association (AERA), and the Collaborative Action Research Network (CARN) are three of the numerous communities that began at the national level and have extended their reach beyond national boundaries by sponsoring and/or organizing international practitioner research conferences (Cochran-Smith & Lytle, 2009).

While some communities transcend geopolitical boundaries, others transcend physical boundaries and operate in boundaryless online places. These online communities "connect geographically dispersed and distant local sites" (Cochran-Smith & Lytle, 2009, p. 13). While it began as a writing workshop in a physical location, the Bread Loaf Teacher Network (BLTN) started "one of the first…electronic teacher networks in the" United States (Bread Loaf Teacher Network, 2010). These online communities have facilitated the development of "new relationships across boundaries of place, ethnicity, race, culture, and language" (Cochran-Smith & Lytle, 2009, p. 22).

Other online communities, such as the Carnegie Foundation's Carnegie Academy for the Scholarship of Teaching and Leaning (CASTL) Program for K-12 teachers and

teacher educators, “create a space for an interactive intellectual community where distal educators can participate in enriching and inventing the documentation of teaching learning practices” (Cochran-Smith & Lytle, 2009, p. 22). The National Council of Teachers of English (NCTE)-supported online community called CoLEARN “supports a large school-based network of inquiry teachers” (Cochran-Smith & Lytle, 2009, p. 25). Other online communities, such as the Teachers Learning Network (TLN) operate under “the assumption that society currently underestimates the potential and the complexity of teachers’ work and that ‘good teaching’ is currently being defined by people and institutions other than teachers”, and it “enables access to national discourses on key educational issues” which “provides a kind of infrastructure of various kinds” (Cochran-Smith & Lytle, 2009, p. 22). As Cochran-Smith and Lytle (2009) point out, a strength of teacher communities such as BLTN, CASTL, and TLN that operate in online places is that they “are essentially without boundaries and uncontrollable by the hierarchies of schools or districts or the intrusions of federal education policy” (Cochran-Smith & Lytle, 2009, p. 23).

Viable System Model (VSM)

Based on a limited amount of research conducted on and off over the past eight years, the viable system model seems fairly obscure. It is a model that exists on the fringe of cybernetic thinking that was created by a cybernetician who operated largely as an outsider of the cybernetic community (Hildbrand & Bodhanya, 2015; Medina, 2011; Pickering, 2010). Much of the research related to the model seems to address organizational and managerial studies. Therefore, I had to be creative to find relevant viable system model-related research. The remainder of this section of my literature

review is written based on the assumption of a cursory understanding of the viable system model, which can be gleaned from its explanation in the following chapter.

Viable System Model and Online Places

Given its definition as the study of communication and control in living and non-living actors, it stands to reason that recent cybernetic scholarship pertaining to VSM also addresses online activity as part of a larger network constituting that which is society. Harwood (2009) addresses VSM in the context on online places as a subsystem of and a tool for the Scottish tourism industry. Millwood and Powell (2011) used it as a post-hoc method to analyze data generated in the context of online distance learning. In this study, online places are presented as venues for communities of inquiry and practitioner research. While previously mentioned studies do not do so, other research related to VSM and online places focuses specifically on social media. Young-McLear (2015) uses the model to evaluate its role in federal responses to large-scale disasters. Not all VSM literature treats online activities as place-based events. Watts (2009) addresses "online data management" as a form of "self-learning" that can be diagnosed with VSM.

Viable System Model and Situated Knowledge

Given its exploration of inquiry and practitioner research, it is perhaps not surprising that VSM has also been used to address situated knowledge. Atkinson and Solar (2009) use VSM for "diagnosis and knowledge acquisition" and application (p. 8); as well as for "using neural network learning from the game conditions and the policy provided by a human coach" to understand "what can be learned from simple models such as insects about the cognitive process and characteristic autonomy of living

organisms" (p. 4, 7). Pickering (2010) has written about VSM in relation to actor-network theory and Haraway's (2006) cyborgs. Pickering (2010) uses these concepts to understand the situated knowledge of the observer as a "part of the system" (p. 25); as well as situated knowledge in relation to economic production; and "about systems – human, non-human, or both – that stage their own performative dances of agency that foregrounded performance rather than treating it as some forgettable background knowledge" (p. 381). O'Donoghue (2006) used VSM to explore student learning and teaching that was mediated by digital technologies. "Within this model [VSM], the students are perceived as a self-organizing community of learners composed of multiple zones of proximal development" (O'Donoghue, 2006, p. 57). Williams and Hummelbrunner (2009) use VSM to look at "knowledge generation as [an] aspect of subsystem four" (p. 208), a specific aspect of VSM that will be explained in greater detail in the following chapter.

Viable System Model and Teaching/Social Change

Literature addressing VSM and teachers as transformative intellectuals is scant to non-existent. Nevertheless, much cybernetic literature addresses broader versions of the concept by looking at VSM as it pertains to teaching and social change. A now-classic example of cybernetics and teaching can be found by looking further into the contributions of Stafford Beer, the British cybernetician who developed VSM, who created an algedonic, negative feedback device in 1956 that taught grade-school aged children how to solve multi-variable algebraic equations (Pickering, 2002). Johnson and Leydesdorff (2015) have also used it to explore gamification and teaching. O'Donoghue (2006) has used VSM to diagnose the role that technology plays in teaching and learning.

Not limited to grade school settings, VSM has also been used as a means of after-the-fact analysis of a campus-wide, higher-education curriculum (Millwood & Powell, 2011). Espejo and Reyes (2011) explore VSM as it relates to teaching in university-based settings as well as social change via learning.

As previously mentioned, cybernetic literature does not discuss transformative intellectuals, yet it does address social change. Yolles and Fink (2011) use VSM to explore the agency of living and non-living entities. Yolles and Fink (2011) argue compellingly that organizations can be viewed as entities with personalities and agencies that provide the potential to affect change. Barragán-Ocaña et al. (2012) utilize CoPs in conjunction with VSM to demonstrate how "communities develop in a self-organizing and emergent manner, and can be viewed as autopoietic systems" in order "to better understand the way in which these communities face the complexity of their environments" and “to locate these characteristics of self-adaptation, self-protection, self-repair, real-time alarms, and control” (p. 741-742). Stokes (2008) explored social change and VSM by arguing that it is a means through which “hierarchical corporate power” could be replaced by “publicly funded but voluntary, and self-governing associations” and as a result “democratic government will be able to work better” (p. 14). This approach could function as a bulwark to prevent and/or reverse the proliferation of neoliberalism in education and all its deleterious consequences. However, the idea that the state “should move away from providing services to regulating service providers” could be viewed as an encroachment of neoliberal ideology (Stokes, 2008, p. 14). In a study with less equivocal findings, Thomas (2006) posits a question asking if VSM could

viewed as something that is inimical to freedom, before looking at multiple competing visions of freedom, and determining that VSM is in fact not inimical to freedom.

Teachers as Transformative Intellectuals

Devaluing and deskilling the work of teachers is a theme found in critical-pedagogy literature (Apple, 2013; Giroux, 1988). Giroux (1988) explains that devaluing and deskilling is the result of an increased prevalence of "instrumental ideologies that emphasize a technocratic approach to both teacher preparation and classroom pedagogy" (p. 123). Apple (2013) refers to the aforementioned process as "proletarianization". Viewed in terms of class and gender, Apple (2013) explains that proletarianization has resulted in an overall expansion of teaching positions with relatively low levels of autonomy and control, coupled with a decrease in the number of positions with higher levels of autonomy and control. The latter group is comprised of administrators who are disproportionately men and are experiencing an increase in the level of professionalism ascribed to them by society, while the former is comprised of classroom teachers who are disproportionately women and are working in positions with decreasing levels of ascribed professionalism. Giroux (1988) argues that this problem can be countered by teachers who operate as transformative intellectuals and "take responsibility for raising serious questions about what they teach, how they are to teach, and what the larger goals are for which they are striving" (p. 126).

Operating as a transformative intellectual is one aspect of critical pedagogy, which is largely influenced by a Freirean approach to praxis as process of action and reflection (Kincheloe, McLaren, & Steinberg, 2012). Giroux's (1988) concept is also influenced by Gramsci's notion of intellectuals as those who "can provide the moral,

political and pedagogical leadership for those groups which take as their starting point the transformative critique of the conditions of oppression" (Giroux, Shumway, Smith, & Sosnoski, 1984). Classroom teachers, and educators in general, can operate as transformative intellectuals by adopting, implementing, and refining their own personal approach to critical pedagogy, by engaging in empirical critical research, and/or by contributing to critical thought and theory (Kincheloe et al., 2012). These categories are not mutually exclusive. People can and do operate in many areas.

While perhaps as a result of its Freirean influence, literature pertaining to teachers who function as transformative intellectuals oftentimes focuses on people who are oppressed. Studies have addressed queer youth of color (Grady, Marquez, & McLaren, 2012), egalitarian educational reforms designed to facilitate social and gender justice (Lopes Cardozo, Sawyer, & Talavera Simoni, 2015), and ostracism of critical pedagogues in oppressive regimes (Sedeghi & Ketab, 2009).

Perhaps also as a result of its Freirean foundations, the related literature that addresses teachers as transformative pedagogues is also oriented toward action research (e.g., Adler & Iorio, 2013; Moscovici, 2007; Ukpokodu, 2007; Wong, 2014). In addition to the above mentioned, much of the literature addresses matters pertaining to teacher education programs. Researchers have addressed specific content areas such as science methods (Moscovici, 2007), social studies methods (Ukpokodu, 2007), and early childhood education programs (Adler & Iorio, 2013).

Although it addresses a broad range of issues, much of the literature related to transformative intellectuals in education is arguably less accessible as it exists only in the form of dissertations which are, due to their extensive use of technical vocabulary and

their sheer length, often overlooked by novice-level and intermediate-level researchers. According to a database search at the University of Northern Colorado's University Libraries website, approximately one-third of English language educational research literature related to transformative intellectuals existed in dissertation format (e.g., Herath, 2015; Hersey, 2012; Jeong, 2013; Nievera-Lozano, 2016; Sarkar, 2012).

Electronic Ethnographies

Digital Ethnographies

Ethnographies that treat technology as a tool and explore a shared culture's use of digital devices that are not necessarily connected to the Internet, such as the use of graphing calculators in mathematics classes (Rivera, 2007), the role of tablet computers in research (Tilton, 2016), and how interactive whiteboards impact classroom language learning (Schmid, 2007) fall into this category. This approach was less than ideal for my study which explored the significance of the role played by non-human, digital ICTs that operate as actors.

Virtual Ethnographies

Other ethnographies look at virtual worlds such as *Second Life* (Firat & Yurdakul, 2011), *World of Warcraft* (Silva & Mousavidin, 2015), or the spread of an "insider gaming practice…across a group of tween players ages 9-12 years…in a virtual world called Whyville.net" (Fields & Kafai, 2009, p, 47). These types of ethnographies seem to operate based on the assumption that these worlds are "sandboxes" that are hermetically sealed and separate from that which constitutes reality. This approach was not ideal for

my study because I view activities that happen in online places as being influenced by and being influencers of human existence.

Online Ethnographies

Online ethnographies are closer to what I strove to do with my research study, but the approach still falls somewhat short. Online ethnographies view activities in online places as actions that seem to exist largely in relation to non-digitally mediated interactions (Schrooten, 2012; Teli, Pisanu, & Hakken, 2007). It can be viewed as a combination of physical and virtual fieldwork (Murthy, 2013). While this approach complimented the way that people used digital technologies at the turn of the 21st century, the same cannot be said in an era where people possess the knowledge to utilize myriad Web 2.0 technologies, social media, and portable digital internet-connected devices. Face-to-face interactions are often punctuated by and occur simultaneously with activities conducted in online places. Cyberethnography was considered at great length, however, I ultimately decided against it because it seems to be well suited for groups that have both online and physical aspects (Teli et al., 2007) and I was interested in a culture that exists to address physical-world issues, but did not necessarily have a component wherein members interact in the physical world.

Ethnographies for the Internet

As Markham (2017) argues convincingly, “our overall cultural experiences are mediated by digital technologies” that are “both more banal and as Christine Hine articulates, more ‘embedded, embodied, and everyday’” and that “whether we’re ‘online’

in the classic sense or not", we "carry the internet with us in our pockets" (p. 1). This approach is based on the idea that the Internet is:

> embedded in various contextualizing frameworks, institutions, and devices, that the experience of using it is embodied and hence highly personal and that it is every day, often treated as an unremarkable and mundane infrastructure rather than something that people talk about in itself unless something significant goes wrong. (Hine, 2015, p. 32).

This approach has been used in netnographic inquiry (Kozinets, 2015), by "researchers who are interested in capturing and critically examining the education and learning occurring in informal sites" of learning "especially in online communities" (Sandlin, 2007, p. 288).

Actor-Network Theory

Actor-network theory (ANT) is based on a refusal to acknowledge "any ontological separation between materiality and meaning" and "is therefore critical of social constructivists as well as realists in assuming that materiality and representation are separate realms" (Fenwick & Edwards, 2012, p. xi). As is explained in more detail in the following chapter's section on post-humanism, my study was founded on an understanding that embodied material existence and disembodied symbolic representation are two characteristics that people have always possessed.

A Brief Explanation of Actor Network Theory

ANT is based on the idea of symmetry. Symmetry is the ontological belief that "everyday objects and parts of objects, memories, intentions, technologies, bacteria, texts, furniture, bodies, chemicals, plants…all things are assumed to be capable of exerting

force and joining together, changing and being changed by each other" (Fenwick & Edwards, 2012, p. x). In other words, all entities, whether they are human or non-human, living or non-living, material or immaterial, possess the same potential for agency and the same potential to affect change. The process of forces working on each other is known as translation. It occurs as working entity, known as an actor, mobilizes an "actant" (a worked-upon entity) into a particular role and performs "particular knowledge in a particular way….with what appears to be particular intentions, morals, even consciousness and subjectivity" (Fenwick & Edwards, 2012, p. xii).

An assemblage is when a gathering of materials is brought together via translation. "Dynamic attempts by actors to translate one another…can settle into a stable process", such as a viable system, "or [an] object that maintains itself" and are referred to as networks (Fenwick & Edwards, 2012, p. xii). One way that networks maintain themselves is with delegation which is a type of immutable mobile that extends the power of networks "by moving into different spaces and working to translate entities to behave in particular ways" (Fenwick & Edwards, 2012, p. xv-xvi). Immutable mobiles are "only visible within a particular network of relations. They can be silent, ignored, or overridden by other active objects. However, they have developed enough solidity to be able to move about and still hold their relations in place"; another type of immutable mobiles are obligatory passage points, or "central assemblages through which all relations in the network must flow at some time" (Fenwick & Edwards, 2012, p. xv, xvii).

Actor-network theory can be used as method or as methodology. As the purpose of this study was to gain a better understanding of the non-human actors that sustain the systems or networks that comprise the online place in which teachers operate as

transformative intellectuals, the ANT concept of symmetry helped me view both halves of that ecosystem in a way that is congruous with my stance as a researcher.

Other Network Frameworks

Perhaps more so than other sections of this literature review, ANT has an extensive body of works pertaining to educational studies and theories published within the past decade. Fairly recently, Fenwick and Edwards (2010, 2012) have written a book and edited another about ANT in education and educational research. My study sought to understand more about networked, online shared cultures. While I intend to use ANT, other similar theories, such as social network analysis, have been used to explore matters pertaining to education and or learning occurring in online contexts related to higher education (Rienties & Heliot, 2016), educational leadership and accountability policies (Liou, Daly, Brown, & del Fresno, 2015), and improving collaboration among students (Moolenaar, Sleegers, & Daly, 2012).

ANT has been used in conjunction with activity theory to look at the role that digital technologies play in teaching and learning within the context of higher education (Mlitwa, 2007), and to understand in-service teachers' interactions and patterns of behavior in purpose-built online places. However, activity theory is not a useful analytical tool for the loosely defined, dynamic, boundless networks of educators which I seek to understand because it requires an intended outcome, "divisions of labor", and "rules and regulations" (Conole et al., 2011). Also, activity theory studies (Mlitwa, 2007) view digital information and communication technologies as specialized tools rather than

entities with the potential for agency. Therefore, I have decided against using activity theory.

Social network analysis has also been used in conjunction with ANT to look at teachers' online networks (Conole et al., 2011), as well as teachers whose networks transcend the boundaries of the schools at which they teach and the boundaries of the Internet (Carmichael et al., 2006). Other researchers (Knox, Savage, & Harvey, 2006) have looked at the relationship between ANT and social network analysis that exists outside literature related to educational research, highlighting relationships that predate Web 2.0, and shedding light on social network analysis' foundations in quantitative analysis.

Summary

Myriad analytical and conceptual frameworks exist for examining learning environments, online places, and transformative teachers. Many ethnographic approaches have been used to explore these types of shared cultures. However, many have aspects that make them less than ideal to use for my study. Some analytical frameworks, such as activity theory and social network analysis, require the assumption of established rules and regulations which seems unrealistic for the types of teachers and groups that I seek to understand. Additionally, some approaches, such as computer-mediated collaborative learning and computer-mediated communication, treat digital information and communication technologies as mere instruments, simple tools instead of actors with potential to exert agency. Some ethnographic explorations of online places treat virtual worlds as entities that are hermetically sealed and separated from that which constitutes reality, others view it as an aspect of the world that exists only in relation to the physical

world. Rather, this study viewed online places as one of the many different types of spaces in which people interact mundanely.

CHAPTER III

METHODOLOGY

This chapter contains an explanation of my methodological approach. Additionally, a description of my epistemological stance, a combination of poststructualism and critical inquiry is included. Also addressed is, beyond communities of practice, a framework utilized by my study. Afterwards, I explain my stance as a researcher and how my academic, professional, and personal experiences have informed my stance. This chapter also provides a brief overview of the online settings in which my study took place as well as a brief description of the types of transformative teachers who have the potential to be participants in my study. Also included in this chapter is my explanation of the ethical considerations that influenced ethical decisions pertaining to my study. Next, I address data sources and the methods of collection and analysis used to address both of my study's research questions. Lastly, I discuss techniques that were implemented to improve the validity and trustworthiness of my study.

Methodological Perspective

Methodologically, my study was an amalgamation of multiple approaches. I will be using a critical ethnographic perspective. This perspective was employed to address my first research question, and the viable system model (VSM) was used to inform my approach to my second research question. While both could have been treated as viable stand-alone questions, I elected to treat my second research question as subsystem of the first question. I decided to present it in such a manner so I could provide an example the

viable system model which was the method of analysis that I used with my second research question and as an example of the cybernetic thinking that informed the ontological and epistemological perspectives upon which this research project was based.

Bricolage

My overall approach to this qualitative inquiry was "bricolage" which "can be considered a critical, multi-perspectival, multi-theoretical and multi-methodological approach to inquiry" (Berry, 2011; Denzin & Lincoln, 1999; Kincheloe, 2005; Rogers, 2012). The term is derived "from a traditional French expression which denotes crafts-people who creatively use materials left over from other projects to construct new artifacts" and "it signifies approaches that examine phenomena from multiple, and sometimes competing, theoretical and methodological perspectives" (Rogers, 2012, p. 1).

Many ethnographies oriented toward digital information and communication technologies were at odds with my personal paradigm because they seemed to be rooted in the belief that people have to plug-in to online worlds to be part of them as well as the belief that anyone can unplug from this existence. This perspective made sense before the proliferation of Web 2.0 technologies during the early decades of the 21st century. However, this is no longer the case.

This is not to sound dystopian. Consider how wonderfully it has benefited public health. In 1982 in Chicago, the third largest city in the United States, bottles of over-the-counter pain-relief medication had become tainted with poison. State and local police officers drove around the city in their squad cars using megaphone loudspeakers to tell

people to throw away their Tylenol. Thirty years later, in western Africa, the continent with the lowest percentage of cell phone users in its population, public health officials warned people living in remote areas about the Ebola outbreak via mass text messages.

My methodology, as well as my methods for my first research question, were mostly influenced by a critical ethnographic perspective (Carspecken, 1996), which aligned with the critical perspective in this study's epistemology and ontology, as well as the intent of my research to see if in-service and/or preservice K-12 teachers operated as transformative intellectuals in online communities to challenge power dynamics in society at large. I was also interested in the power dynamics within the shared culture of the online community which I believe could be a potential model for other classroom teachers and other communities. However, it is important to note that this is a study in not an ethnography; rather, it was conducted from an ethnographic perspective using ethnographic methods (Green and Bloome, 1997).

Critical Ethnographic Perspective

In my study, I looked at a shared culture. Therefore, I decided to use an ethnographic perspective. While some ethnographic approaches place importance on exploring cultures with discrete boundaries (Pole & Morrison, 2003), this notion is incongruous with post-humanistic and cyborg/cybernetic thought. However, Carspecken's (1996) critical approach does not require an understanding of the boundaries of a culture being researched until later stages of data analysis. Therefore, I employed an ethnographic perspective to gain a better understanding of the human

element of the cybernetic ecosystem that constitute the online community of which I sought to gain a better understanding,

As previously mentioned, ANT works well for description but lacks mechanisms for analysis. Rather, Latour (2005) only provides three "moves" for enacting ANT. However, we are not without concepts by which to understand what makes a network, or a system, viable. For my second research question in this study, I used one of those concepts, the viable system model, for data analysis. However, before understanding the viable system model's place in my study, it makes sense to look at the framework used to address my second research question.

Conceptual Frameworks

Crotty (2003) presents four elements of social research: epistemology, theoretical perspective, methodology, and methods. Epistemology refers to the "theory of knowledge" which is "embedded in the theoretical perspective" and therefore also embedded in methodology (Crotty, 2003, p. 2). This recursive arrangement is similar to the embedded nature of internet ethics and is discussed in further detail after explaining the methods of data analysis for the second research question of this study. The second element is theoretical perspective or the "philosophical stance informing the methodology"; the third element is methodology which is a "strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of methods to the desired outcomes"; lastly, methods are "techniques or procedures used to gather and analyze data related to some research questions or hypothesis" (Crotty, 2003, p. 3).

Epistemology

My study was based on a social-justice oriented epistemology which is grounded in multicultural education. Paradigmatically speaking, multicultural education operates within the purview of critical inquiry. Historical realism, a fundamental aspect of critical inquiry, is the idea that the structure of reality is "shaped by social, political, cultural, economic, ethnic, and gender values" (Guba & Lincoln, 2005, p. 195). In each previously mentioned category, the values of the dominant group form the basis of reality, resulting in school systems that deny educational opportunities to students with values that differ from the dominant group.

Epistemologically, multicultural education occupies a philosophical place in between critical theory and poststructural approaches. Given its social justice perspective, multicultural education seeks to "question power structures and [challenge] the status quo" (Nieto & Bode, 2012, p. 52). These characteristics align with poststructural emphasis on efforts to "deconstruct, problematize, question, [and] interrupt" (Merriam, 2009, p. 11). Multicultural education also utilizes queer theory (Mayo, 2010), another aspect of poststructuralism. However, multicultural education's encompassment of feminist perspectives (Tetreault, 2010), critical pedagogy (Nieto & Bode, 2012), and Latino critical theory (Bernal, 2002) displays influence by critical theory.

Some have argued that this eclectic epistemology is inherently contradictory (Sidorkin, 1999). While poststructural philosophy eschews grand narratives, critical theory espouses liberatory and/or emancipatory narratives. This contradiction is exemplified by the universal notions of "justice, democracy, and good life" which are valued in critical theory, yet are rejected by poststructuralism which does not place value

in “universals” (Sidorkin, 1999, p. 145-147). Notably, Sidorkin (1999) views this contradiction as a potential strength. However, he advocates for a “more engaging mode of disagreement” that would “replace the weak ambivalence of doubt with a strong ambivalence of polyphony” (Sidorkin, 1999, p. 154.)

Polyphony is a notion posited by Mikhail Bakhtin. A polyphonic truth is derived from a dialogue in which “two or more theories contradict each other, and yet” at the same time they also “truly address each other” (Sidorkin, 1999, p. 152). Rather than rejecting established theories, polyphonic theorizing seeks to preserve “old distinctive theories” while at the same time using them to “address each other, and to answer each other’s claims” (Sidorkin, 1999, p. 153). By embracing these contradictions, instead of ignoring or rejecting them, multicultural education is a powerful tool for epistemological critique. Poststructuralism can be used to ask why critical theory does not question “the criteria for distinguishing groups with respect to the multicultural agenda”; while critical theory includes a call to action against forces of oppression that poststructuralism lacks (Sidorkin, 1999, p. 145, 147).

Cyborg epistemology. Cyborg epistemology is based off a cyborg as being defined as a hybrid artifact-organism system that is capable of extending humankind’s unconscious and self-regulatory controls. They have three characteristics: “they are hybrid of human and non–human components”; they are systems, with “interdependent elements” that are “upgradeable and removable, but relationally dependent on each other”; and lastly, “their aim is to extend human unconscious capabilities” (Teli, Pisanu, & Hakken, 2007, p. 214). Cyborg epistemology blends well with ANT and critical inquiry. It translates human and non-human entities into hybrids that are stable while

"collapsing…boundaries between the different ontologies, as well as making questionable the origin of these ontologies and the political meanings they have acquired, which give form to the different meanings of reality" (Teli et al., 2007, p. 215). To Haraway (2006), the cyborg can be seen as the simultaneous representation of humans as symbolic and embodied beings or as "a condensed image of both imagination and material reality, the two joined centers structuring any possibility of historical transformation" (Haraway, 2006, p. 118). Much like Haraway, I believe that research can result in analysis and activism.

Analytical Framework

Beyond communities of practice is the analytical framework I informed my approach to the first research question in my study. It was how I intended to frame the human aspects of the system or network that comprises the online community. Instead, I used topic domains from my interview questions, which is explained in greater detail in a subsequent chapter. Beyond-CoP is derived from Wenger's (1998) concept of communities of practice. While CoPs, as an analytical framework, has strengths and could be used to study myriad contemporary situations, it has been identified as having weakness, such as assuming a sense of "belongingness" which does not necessarily happen in communities such as the hypothetical classroom described in the previous chapter, as well as connoting membership that is oftentimes far from formalized or uniform, and lastly the term is often applied varying degrees of affiliations (Gee, 2005). This led some researchers to implement and advocate for the use of "beyond-CoP" as a way to talk "about a group of people, rather than a space for activity" and to "address

power and conflict" (Barton & Tusting, 2005, p. 1, 11). Beyond communities of practice also aligns with Carspecken's (1996) seven ontological models.

Carspecken (1996) argues that rigorous critical qualitative research will produce "well defined ontological models" and identifies seven of them. With that said, some have called into question the ability of communities of practice (CoP), actor-network theory (ANT), and the viable system model (VSM) to operate in a way that is not apolitical and acritical. I combed through the various bodies of literature related to CoP, ANT, and VSM to locate equivalent concepts that were capable of addressing all seven of the ontological models. This alignment suggests that all four frameworks (ethnographic perspective, COP, ANT and VSM) possess the requisite variety to be used together in a way that is political and critical.

For my second research question, I analyzed my data with the viable system model (VSM). The viable system model is a five tier system based on methods of communication found in both living and non-living entities. The VSM views entities as systems that are parts of larger systems that are surrounded by complexity. A system with less internal complexity than its surrounding environment, that recognizes features and patterns, and is able to remain "in balance" with surrounding organizations is viable. Viable systems have built-in redundancies, are able to reduce variety and complexity, possess the capacity to adapt and change in their environment, can return to a state of equilibrium after unknown or unforeseen perturbances, and are recursive in nature. In other words, systems contain subsystems that contain subsystems, which in turn contain subsystems containing subsystems. These systems are self-organizing and self-regulating. These subsystems are similar to Russian nesting dolls with the possibility of having

twins, triplets, quadruplets, quintuplets, sextuplets, etcetera, at every level of recursion (Espejo & Gill, 1989). Tiers one through three, which are “operations”, “coordination”, and “integration and control” respectively speaking, are concerned with material relationships. Tier three and tier four deal with “future planning” and perform lower regulatory coordination of actions with the material and social environments. Tier five addresses matters pertaining to policy. Each tier will be explained in greater detail in the sections below.

Tier one. Tier one systems address matters pertaining to implementations or operations. Viable systems can have multiple tier one systems. Activity at this level is “what a system does and produces” (Yolles & Fink, 2011, p. 84). In the context of higher education, tier one systems that comprise a student’s learning environment might include, but are not limited to, learning activities and episodes such as tutoring sessions, study groups, and the various courses in which an undergraduate student is enrolled.

Tier two. A tier two systems' main function is to facilitate coordination. It “aims at reducing chaos and introducing order” and “amplifies the control capability to try to induce self-regulation” (Yolles & Fink, 2011, p. 4). It is not top-down; rather, it is “‘coordination by mutual adjustment’ between support functions and autonomous units” (Espejo & Gill, 1989, n.p.). Tier two systems prevent conflict from arising between tier one systems (Johnson & Liber, 2008).

Tier three. Tier three systems aim to maintain integration and control. Tier three is “concerned with effective regulation of the dynamics internal to the organization” in addition to being “responsible for the implementation of policies, resource allocation and control and monitoring of the implementation activities”, and it also “determines

information needs" (Yolles & Fink, 2011, p. 84). Tier three systems are for "two-way communication between sub-unit and meta-level unit" which is "a prerequisite for viability" (Espejo & Gill, 1989, n.p.).

Tier three star. This tier operates as an audit that functions as a monitor. Unlike tiers one through three, it "is not an independent subsystem but rather a measuring instrument that measures the deviation of the system from the norms that are regulated" by tier three systems (Yolles & Fink, 2011, p. 85). Tier three star systems complete the "collection of channels needed to manage the complexity of current learning activities" (Johnson & Liber, 2008, p. 6).

Tier four. Tier four systems are focused on future planning. It "involves issues of development and strategic planning, gathering information from the environment and the system itself 'It does all the future orientated tasks'" (Yolles & Fink, 2011, p. 85). Tier four systems are a "two-way link between the primary activity (i.e.: Viable System) and its external environment. Intelligence is fundamental to adaptivity" for two reasons, "firstly, it provides the primary activity with continuous feedback on marketplace conditions, technology changes and all external factors that are likely to be relevant to it in the future;" additionally, tier four systems project the "identity and message of the organization into its environment" and they "must operate in balance" between too much information from the external environment on the one hand, and not enough feedback of strong outward communication on the other hand (Espejo & Gill, 1989, n.p.). In an educational context, discovery in one learning activity contributes to another and looks for "self-development and future learning possibilities" and "needs to be well connected

to the larger environment, and permit both the discovery of learning opportunities and the publication of learning profiles" (Johnson & Liber, 2008, p. 6).

Homeostasis. A vital aspect of any viable system is the concept of homeostasis. While it is not an independent subsystem; the homeostat is, nevertheless, a fundamental component of viable systems because it facilitates a return to equilibrium after unknown and/or unforeseen external disturbances. A classic example of a homeostat is the thermostat found in heating-and-cooling systems. In this instance, the heater and the air conditioner are both tier one systems. If the thermostat is set to 65°F and the ambient air temperature drops below that setpoint, then the heater is engaged. If the ambient air temperature exceeds the setpoint, then the air conditioner is engaged. In this scenario, equilibrium is achieved when the ambient air temperature reaches 65°F. When equilibrium is achieved, it disengages whichever system is running to maintain equilibrium rather than running both systems at the same time. In a viable system, a homeostat bridges tier three systems and tier four systems.

Tier five. Tier five systems manage policy. Tier five systems are "concerned with the establishment and maintenance of a coherent context for the processes of the organization." They establish the "direction of the organization", they "relate to what the organization sets out to do", and contribute the "systematic capability to choose from the different problem situations or opportunities thrown up by the environment"; additionally, tier five systems are "concerned with identity and cohesion and with monitoring the balance between emphasis on Integration/control" in tier three systems and future planning in tier four systems (Yolles & Fink, 2011, p. 85).

Tier five systems facilitate “low-variety, highly selective interactions” between tier three systems and tier four systems” and they “provide clarity about the overall direction, values and purpose of the organizational unit and…a final sanity check” (Espejo & Gill, 1989, n.p.). Tier five systems create the means for “‘what if’ questions to be asked, so that new opportunities do not overwhelm current learning activities”, in other words “the future and the present need to be in a dynamic balance” which is “determined ultimately by some notion of who the learner thinks they are, and who they want to become” (Johnson & Liber, 2008, p. 6).

Researcher’s Stance

Educational and Academic Background

My first experiences as an educator occurred when I was still an adolescent. In high school and during my first four years of college, I spent my summers teaching outdoor education at summer camp in rural mid-Michigan. The summer camp catered toward elementary-school and middle-school aged children with behavior issues, at the time labeled with the now-outdated term “at-risk”. When I began working at the camp, most of the campers where White kids from suburban middle-class backgrounds. I was familiar with the contexts in which they lived and the type of background from which they came, which I think helped me begin to be aware of privilege as I started to understand the ableist discrimination that my campers experienced as a result of their mental-health issues. After a local economic downturn, there was a demographic shift in the types of campers who attended the camp. Prior to the downturn, most campers were referred to the summer program by school counselors and their parents’ health insurance usually paid the fees to attend the camp. However, after the shift, the camp partnered with

a social service organization based in a nearby urban area and most of the campers were African Americans from urban, low-income neighborhoods who had behavior issues. As my campers told me about their experiences at home and in school, I started to become aware of the notion of intersectionality, when I became aware of the disparity of social services between my former campers and my then-current campers.

At this time, I also started to become aware that relevance seemed to facilitate engagement. While working at the summer camp, I also started to come to the realization that learning could happen outside of schools. I also started to notice that kids who supposedly had learning and behavior problems could focus on difficult tasks and learn them relatively quickly as long as that information was presented in a way that was relevant to the immediate situation. Learning how to start a fire is relevant when someone is outside and the weather is becoming colder, learning how to set up a tent is relevant when someone is outside and it is starting to get dark, learning how to purify water is relevant when someone is not near potable water and is outside exposed to the elements. While working at the camp I gained knowledge that was vitally important in some contexts and largely irrelevant in other contexts. For instance, knowing how to survive from food scavenged in the wilderness of northern Ontario has very little practical application in an urban southwestern city like Denver, Colorado. I was also exposed to the larger geo-political knowledge that can be gained from those who have access to local funds. Some of the most enlightening information that I ever heard about the Irish Troubles in the late 1990s came not from people who were experts in the field, but from my Catholic co-worker from Northern Ireland and my Protestant coworker from England have a candid discussion about their experiences during those tumultuous times.

While I was becoming aware of the concept of funds of knowledge at this time, I would not experience their practical application until over a decade later when I began making a podcast related to education. While I was still in high-school, I realized that the teachers who held my attention in class and make learning an engaging endeavor did so by presented material in a way that explained its relevance which was like the way that my colleagues and I taught outdoor education. At this point, I decided that I wanted to be a classroom teacher and present material in an engaging way to make learning interesting.

Shortly after I entered college in southeast Michigan as an undergraduate in the fall of 2001, I had the intention of getting a degree in secondary social studies education. However, NCLB and other student assessment and teacher evaluation policies began to make it more difficult for K-12 teachers to present information in a way that was relevant and engaging. At this same time, local economic issues were resulting in fewer and fewer teaching positions in the area. In search of more opportunity, I relocated to Denver, Colorado to complete my undergraduate studies. I also decided to continue my university studies and obtain a masters' degree so that I could teach in higher education and have more academic freedom. At this time, I focused my studies on the history of social injustices and telling history from the perspective of people from marginalized social groups. At this time, I also began to research the viable system model and started to gain interest in social theories of technology compatible with the concept of symmetry.

After I earned masters' degree in history, I was technically qualified to teach at the community college level. However, in reality a high supply of qualified people in relation to a slow supply of positions meant that I would need a doctoral degree to teach history at the post-secondary level. I considered doctoral programs in history and in

political science (the area in which I minored as an undergraduate). Unfortunately, I was unable commit to spending average five to seven year working on that type of dissertation. At this time, I also began teaching in a special-education center at an elementary school where approximately 75% of students qualified for free or reduced lunch, in a low-income neighborhood of a suburb bordering Denver, Colorado.

Not surprisingly, few teachers who were men worked at this school. I believe this helped me start to become aware of instances of male privilege in education. At times, my male colleague and I would be praised by administration for making failed attempts to take care of an unruly students. At the same time, when our colleagues who were women were in nearly identical situations with the same students, they would be verbally reprimanded by administration for not being able to rectify the situation.

While teaching at this elementary school, I began working on state standardized tests for the Colorado Department of Education. I was aware of the fact they were part of restrictive reforms and systems of student assessment and teacher evaluation, but I thought I could change the system from within by making it more relevant. However, I quickly realized that I was not in a position to affect a great deal of change. Nevertheless, my work with the department of education led me to consider the idea of pursuing a doctorate in education, as I was often working with others who had doctorates and I felt that, professionally speaking, I could operate at their level.

Shortly after beginning my Doctor of Education program, I began teaching at a different school. This school was also in a low-income neighborhood. However, this school was located in an urban setting, with approximately 90% of students qualifying for free or reduced lunch, with 99% students of color (90% Latino/a, 9% African American,

1% White). I taught special-education students with affective needs in grades six through eight. During this time, I continued to work on state standardized tests.

At the start of my second year of course work in my doctoral program, I began working as a teaching assistant for a course in the foundations of education. While working in this position, I learned more about the culturally whitewashed academic standards and curricula upon which student assessments and teacher evaluations are based. I also became aware of the extent to which these reforms systemically disadvantage low-income students and students of color.

Later in this same academic year, I was given an assignment about innovation in education and had intended to submit an uninspired essay. However, I took advantage of a last-minute opportunity to spend a weekend at a hotel resort in the Rocky Mountains. While I was there, I heard a song on the radio entitled “Go Outside” and I decided that I wanted to incorporate it into my outdoor education assignment. Instead of merely quoting it, I decided I wanted to include an audio excerpt from the song into my assignment. As an avid listener of podcasts, I decided that a podcast would be a better format than a written essay. Instead of merely uploading an audio file of the podcast to submit the assignment, I decided to create an account and make my podcast publicly available in the iTunes store. On a whim, I also shared my podcast over my personal Facebook account. I enjoyed the process of creating and sharing the podcast. After receiving some positive feedback from friends and family, I decided to use material that I had written for assignments in my doctoral coursework to create content for more episodes of the podcast. As a consumer of podcasts, I had heard professional podcasters say that it is important to promote podcasts over social media. With that in mind, I created social

media accounts dedicated to my podcast and began to promote episodes on Facebook and Twitter.

Before ever receiving a grade on the assignment for which I had submitted it, my podcast had been nominated for an award from the Academy of Education Arts and Science International, which describes itself as "an eclectic cadre of leading educators, education leaders, education professors, journalists, editors, researchers, commentators, advocates, commentators, advocates, activists, visionaries, and pioneers" (Academy of Education Arts and Science International, 2012, n.p.). In addition, numerous other teachers messaged me over social media to tell me that they had found the content of my podcasts to be helpful for them. To me, this signified the extent to which online communities value and utilize material created via teacher inquiry and/or practitioner research.

The following school year, while still teaching middle-school special education, I was presented with the opportunity to develop and teach a social-justice oriented, social-studies curriculum to my middle-school special education students. Much like the latter type of campers whom I taught, my middle schoolers had been identified as having behavior issues and learning disabilities. Many of them were years behind in reading levels. However, I would argue that this is largely because the curriculum is not relevant to them. In search of culturally relevant materials, I searched in online places, particularly on Twitter. I was able to find resources from places like the Southern Poverty Law Center and the Public Broadcasting Service (PBS). When presented with culturally relevant information, my students became much more engaged, even though the materials that they were assigned to read were written at a high-school reading level and presented in a

manner more on par with an undergraduate-level history course. My excursions into online places also provided me with an introduction to online communities such as #SaturdaySchool, #EduColor, and the now-defunct Young Teachers' Collective (#YTC).

During this time, I also began to question the extent to which teacher-education programs were preparing classroom teachers (with backgrounds similar to mine) to teach students of color from low-income and urban areas. After talking with my recently graduated colleagues, I began to get the impression that they were unprepared for the task because their teacher education programs did not provide them with the means to access marginalized funds of knowledge.

Online places, such as the ones in which communities of teachers operate on Twitter, are areas in which teachers can assess local and marginalized funds of knowledge in order to teach in a manner that is more culturally relevant. However, the potential of social-media facilitated social change remains largely unexplored. Nevertheless, the role it played in the Arab Spring in 2011 and the role that it played in proliferating "fake new" that significantly impacted the 2016 U.S. presidential election suggests that that social media does have the potential to facilitate change but first we must understand how it operates as part of a larger system, or network, in which humans also operate as actors.

Post-Humanism

By virtue of being able to create abstract, symbolic imagery (such as: visual art, pictographs, hieroglyphics, and characters of alphabets, all the way up to the multimodal digital literacy expressed by many young people today), humans have always been more than merely physically embodied beings. Instead, people must be viewed as existing

simultaneously as both embodied and symbolic beings. This is not a new development ushered in by the advent of digital technologies. Archeological evidence suggests that symbolic imagery was created by pre-anatomically modern humans (Rodríguez-Vidal et al., 2014). Rather, new digital technologies have merely caused post-humanism to receive more attention and be researched and applied in new contexts.

The concept of post-humanism can inform critical inquiry that "sheds light on how the anthropocentric presumptions of much anthropology ignore not just the 'unhuman' but also the 'animal' and the 'not-quite-human' (transgendered, disabled, or psychologically impaired persons), inevitably leading to a challenge, and perhaps an outright rejection, of the whole category of the human, at least as a core concept for anthropological theory" (Whitehead & Wesch, 2012, p. 2).

"[A]s humans become more digitally connected," Whitehead and Wesch (2012) argue that "we must also recognize that the sociality that emerges from such connections might not always be immediately analogous to traditional social formations and may involve unhuman actors and agencies (which may or may not be conceptualized or treated as human)" (p. 9). In addition, it "signals an end to anthropology of a certain kind and the necessity for inventing new ends and new methodologies for anthropological research that will better interpret such changing and emergent cultural worlds" (Whitehead & Wesch, 2012, p. 10). Additionally, people who are from "hidden and marginalized" social groups "can be better integrated into anthropological thinking" about "the ethnography of both the 'unhuman' and the 'digital'" which "leads to exciting possibilities for reconfiguring the notion of what is human" (Whitehead & Wesch, 2012, p. 1-2).

Symmetry

Post-humanism also calls into question “a defining characteristic of the present cultural moment” which “is the belief that information can circulate unchanged among different material substrates” (Hayles, 1999, p. 1). This characteristic is called into question by both actor-network-theory (ANT) and cybernetic theory.

Although it will be explored in greater detail in a subsequent section, it is worth at least mentioning that questioning what it means to be human relates to ANT-based idea that both human and non-human entities can have agency depending on how events or series of events assemble into a larger web of context. As opposed to traditional “sociology of the social”, ANT is the “sociology of associations”. In other words, the social is not the glue that binds reality, it is that which is bound together by reality. It involves the tracing of associations which are flows of information or a “type of connection between things that are not themselves social” (Latour, 2005, p. 5).

ANT also lends itself to examinations of ecosystems made of human and non-humans. As a theory, it argues that things such as ideas, machines, flowers, and viruses can have the same type of agency as people. Take for instance Dutch tulipmania, which occurred in the mid-to-late 1630s. Nearly a century prior, Ottomans gave tulips to the Dutch. Unlike many other flowers indigenous to Holland, each tulip flowered into a single vibrant color. However, a strain of mosaic virus not found in the Ottoman empire infected Dutch tulips causing them to “break” or mutate to have multicolored petals. Over the final few months of 1636, demand for the mutated flowers, combined with scarcity caused by the tulip’s normal growth cycle, raised the cost of some tulip bulbs to the equivalent of ten times as much as a skilled craftsman would have earned that year.

Although some debate exists, many economists and economic historians view the event which had disastrous effects on the Dutch economy as the Western world's first speculative bubble that lead to an economic burst (Gisler & Sornette, 2010). Regardless of whether or not it was a speculative bubble, flowers and a virus operated as part of a network that was able to wreak havoc on the Dutch economy.

Cybernetics

While cybernetics is explained in greater detail in subsequent sections, a brief explanation is needed to fully frame the philosophical perspective from which this study was being approached. Ecosystems as a concept can have an effect of "blurring the lines between living and nonliving components" and cybernetic ecosystems are a concept useful for thinking about the "important distinctions to be made" in the "relationship between nature and technology" (Bryant, 2006, p. 84). It is worth noting that while cybernetic ecosystems can be used in managerial control-based manner to manipulate the natural world, they can also be used in as critical tool to call unequal relationships into question and can be "crucial to a potent and sustained critique of modem industrial civilization and a rationale for an alternative set of cultural values" (Bryant, 2006, p. 57). Digital technologies have not made us more post-human; however, they have situated people into one part of a cybernetic ecosystem comprised of living and non-living entities that further calls into question the distinction between human and unhuman.

Cyborgs. While this is not to say that humans became cyborgs because of digital technologies, it is true that many people in the Western, industrialized world already have a computer that can be plugged into our heads and used to upload information into our brain (via analogue air vibrations) as it happens in real-time from the opposite side of the

world. People have always co-evolved with their technologies, developing the ability, for instance, to walk upright in conjunction with developing the manual dexterity and motor skills necessary to use ever increasingly complex hand-held tools.

Considering that 90% of the cells in the human body are not human genomes, biologically speaking, people have always been ecosystems and parts of ecosystems. This recursive nature is found in the cybernetic concept of the viable system model (VSM) which will be explored in-depth in a subsequent section.

As Haraway (2008) argues, humans and dogs have co-evolved. Dogs are a form of technology, they are intentionally bread for specific purposes (e.g. herding, retrieving, birding, companionship, having floppy ears, etc.). Scientific "findings [suggest] that the unusual social skills of dogs arose as a result of domestication and represent a case of convergent evolution with humans" (Hare & Tomasello, 2005). Humans co-evolve with technology. Therefore, it is plausible to assume that humans co-evolve with the non-living, non-human agents with which
they cohabitate their cybernetic ecosystem. A familiar instance can be found by looking at the relationship between the proliferation of in-home air-conditioners and the population increase in the southwestern United States in the second half of the 20th century. Others have argued that plants, specifically wheat, rice, and potatoes, domesticated humans (Harari, 2014).

While ANT and cybernetic ecosystems do not so much argue that cellphones have the same amount of sentience as a human being, they do call into question the notion of human agency in what Hayles (1999) describes as the "liberal humanist subject". During early modernity, this subject was the White, European, male who was usually wealthy.

Social justice oriented thinkers, such as post-colonial and feminist theorists have called this notion of a "unified constant identity" into question (Hayles, 1999, p. 4). This approach is arguably EcoJustice influenced as well, as it calls into question notions of anthropocentrism and ethnocentrism by looking at the potential agency of non-humans, which will be explained in greater detail in a following section.

Social Justice

In the context of education, social justice is often poorly defined, perhaps due to the fact that it has philosophical, conceptual, practical, theoretical, and ethnographic elements to it (Hytten & Bettez, 2011). Nevertheless, the four components of social justice education compiled by Nieto and Bode (2012) explain my position. Social justice education "challenges, confronts, and disrupts misconceptions, untruths, and stereotypes that lead to structural inequality and discrimination based on race, social class, gender, and other social and human differences"; it provides "all students with the resources necessary to learn to their full potential" including material and emotional resources; however, it "is not just about giving students resources", it is also about "drawing on the talents and strengths that students bring to their education"; and
"creating a learning environment that promotes critical thinking and supports agency for social change" both within education and within society at large (Nieto & Bode, 2012).

Intellectual Undergirding

These beliefs are undergirded by value placed in punk culture that places importance on questioning the status quo and figures of authority and values a do-it-yourself (DIY) ethic (Hemphill & Leskowitz, 2012) and hacktivist values (hacktivist is a portmanteau of computer "hacker" and "activist") that place significance on the practices

of those “who use their skills to invent, modify and refine systems” (Weiss, 2006, p. 25). Hacktivists view “the internet is a site of contestation, and their efforts are an attempt to flush out the hidden curriculum as a reaction to perceived oppressive use of laws and technologies” neoliberal corporate interests as well as “governments for monitor and control issues” (Weiss, 2006, p. 25).

Settings and Participants

Setting and Participants for Research Question One

The setting of my study was in an online place as opposed to a physical space. Two common and frequently practiced online group activities are known as a teach-ins and Twitter chats. For the purpose of this study, I sought to gain a better understanding of teach-ins occurring in the #SaturdaySchool communities and Twitter chats occurring in the #EduColor community. Both teach-ins and Twitter chats are interesting because they demonstrate how technology can develop into something that its developers had not envisioned. Twitter was originally intended to operate solely in conjunction with mobile phones and function as a means of making text messages available to multiple people at the same time (Hardwick, 2016, n.p). However, the development of hashtags changed that. Initially created to allow people to be able to find tweets after the fact, it has now evolved into something that can be used to facilitate synchronous communication.

An informal group of educators often participate in a teach-in event known as Saturday School. It is not uncommon for others to use the term Saturday School in organized and unorganized ways, such as in part of a Twitter chat, or it could be an alliteration casually used to draw attention to something that is related to working, doing chores and, or learning on a Saturday. While other events sharing this name might occur

among multiple informal online communities, I focused on a specific instance of Saturday School. With participants operating as transformative intellectuals, Saturday School occurs on Twitter and in asynchronous time. It is facilitated by a social-justice educator named Laura. Many community participants are in-service and preservice K-12 classroom teachers. In this community, Laura will select a theme for the week. She will then promote it via an image that others can easily share, or "retweet" over Twitter. The image generally has basic background information about Saturday School, as well as a secondary hashtag that serves at least two purposes: it allows people to search for posts made on that particular Saturday (while separating them from posts for pervious weeks of Saturday School) and it allows participants to separate Dr. R's event from other people on Twitter who might also be using the hashtag on that particular day. Figure 1 is an example of an image frequently used to promote the teach-in.

Based on the composition of #SaturdaySchool and #EduColor, the two online communities that I researched, it was possible to have a representative sample and enough people for member checks with a total of six participants. Some participants were representative of people from marginalized social groups, while others had backgrounds similar to in-service and preservice teachers, who tend to be White, middle class, monolingual English speakers from suburban or rural backgrounds.

Figure 1. Example of Saturday School promotional image

Setting and Participants for Research Question Two

The setting for my second research question was the same as the setting for my first one. However, my participant(s) will be different. In order to highlight the non-human elements that sustain the cybernetic ecosystem that comprises the online places that I intend to explore, and focus on the ANT literature notion of the "network as actor", I looked at the roles of non-human, non-living, non-material participants. I treated hashtags commonly used by #SaturdaySchool as one of my participants for the second research question.

Online Ethics

While it is not uncommon to include an ethics section, I felt it was important to include it prior to sections covering research design as the ethics of online research informed my research stance, epistemology, and theoretical perspective, and it significantly influenced the methods utilized to address both research questions in this study.

Unstable ethics. An aim of critical scholarship is to destabilize, confront, and challenge the status quo. At the same time, the Internet facilitates ethical destabilization and requires its users to negotiate (as well as contest) the ethical environment of their cybernetic ecosystem. Internet ethics are both embedded (or localized) and unstable. Therefore, ethical considerations should not be viewed as separate from methodological and theoretical considerations. Given the "dynamic and uncertain nature" of internet-based research and the aforementioned theory-method-ethics connection (Whiteman, 2006, p. 14), it is worth noting that cybernetics, particularly the viable system model (VSM), which was part of the epistemological basis for this study and the basis for my

second research question's methods of analysis, is philosophically oriented toward being able to respond to unforeseen disturbances and regain a sense of equilibrium.

Embedded ethics. Situated ethical issues can be viewed, from the subjective perspective of the researcher, as embedded in an, arguably, mathematically recursive manner. Whiteman (2006) identifies four embedded dimensions: the academy, or the "broad area of academic and/or professional knowledge, research, and debate" such as post-human anthropology or educational studies (p. 29); the institutional, or the setting (college, university, think tank, etc.) where the researcher operates; the researched, the people and/or setting being examined; and the researcher, the person conducting inquiry. In this instance, the academy refers to the field of study, which provides an "important source of guidance for researchers as they move to establish positions in respect of key ethical issues" (Whiteman, 2006, p. 33). The academy is supported by scholarship from the educational and research institutions which function as a "source of 'bureaucratic involvement'" that could be at odds with the negotiated ethics of the other three dimensions (Whiteman, 2006, p. 40). The aforementioned institutions conduct inquiry into many different groups, organizations, and phenomena, collectively referred to as the researched, whose members have established, adhere to, and/or maintain the ethics valued within the research setting. The researched can be, and sometimes are, areas of exploration for myriad researchers, whose ethics are likely influenced by those of the academy and the institution during early stages of the research. At that point it is unlikely that the researcher's ethics have been influenced by the researched and/or codified explicitly. While the last two dimensions could arguably be presented in either order, I

chose to place the researcher last because from my subjective, relative position, I am closest to the researcher

Three continua. Adopting an unstable and embedded approach to ethics requires a "shift away from the idea that researchers should comply with totalising ethical principles" (Whiteman, 2006, p. 9). However, this approach is complex and problematic as each of the four dimensions (the academy, the institution, the researched, and the researcher) are impacted by factors that exist across three continua: public versus private, text versus subject, and observer versus participant. While the first two dimensions are more affected in regards to the big-picture, overall intent and approach, the second two dimensions are more affected in regards to day-to-day activities.

Public versus private. While there is a "nearly 'universal understanding' of the need to protect" privacy, it is problematized by the distinction between an expectation of privacy and technical privacy. The former could, for instance, be a situation where someone is making a mobile phone call to the utility company at a bus stop where the person is aware that they are in public, but also knows that there is a tacit social understanding that others will basically ignore any personal information that they might be saying. While technical privacy is when someone is in physically, auditorily, and/or visually secluded from other people and listening/recording devices (which is relatively easier to discern in a physical setting). Being on the Internet further complicates the notion of privacy as well. Posts intended to be public could be made in a walled garden (in an online place with restricted, or walled, access) and, ergo, not actually be public. On the other hand, information intended to be private could be posted in a walled garden and then be shared with the world by someone who has access to it. It also requires internet

access and a device with appropriate software and applications as well as digital literacy and cultural understanding of the site where the information is located. Many issues could interfere with the intent of the person providing the information in question.

Text versus subject. As a general distinction, text refers to an artifact or the proliferation of information and is a form of symbolic representation; while subjects are embodied human or non-human entities. While Table 1 provides examples of the more simplistic issues that these factors cause in each of the four aforementioned dimensions, it is not always so simplistic. For example, one participant of an online community could view their online written texts as self-published work and, therefore, expect to be cited. While other participants may view online posts as being an aspect of their identity that they want protected via pseudonymity. To further complicate matters, both of these participants could have collaborated to create archival and/or elicited data, resulting in a problematic situation where it is difficult to honor fully the requests of both participants. In this instance, a compromise would have to be negotiated or the data would need to be jettisoned from my research and excluded from my study.

Based on the composition of #SaturdaySchool and #EduColor, the two online communities that I researched, it was possible to have a representative sample and enough people for member checks with a total of six participants. Some participants were representative of people from marginalized social groups, while others had backgrounds similar to in-service and preservice teachers, who tend to be White, middle class, monolingual English speakers from suburban or rural backgrounds.

Table 1

Typical Ethical Questions

	Public vs. Private	**Text vs. Subject**	**Observer vs. Participant**
Academy	What does post-human anthropology/ educational studies view as "public"? What does it view as "legitimate" research?	Does post-human anthropology/ educational studies view participants' online writings as text or subject?	Does post-human anthropology/educational studies place more value on observing as opposed to participating?
Institutional	What does IRB approval permit?	Does IRB approval allow for citing/referencing and attributing of the direct quote of a participant?	Does IRB approval for observation differ from approval for participation?
Researched	What are the norms of the community?	Does the community view written works as actant or artifact? Does community treat things like bots as an entity with the potential for agency?	What degree of observation/ participation will the community permit?
Researcher	Am I comfortable treating a setting as public?	Does the text seem to spread as a symbolic representation or as the online embodiment of a (non)human entity?	What does my methodology and my methods dictate? What is question is my research trying to address?

Observer versus participant. This continuum is highly dynamic as the researcher often experiences "shifts" in relationships with the researched that occur at "moments of 'crisis' [that] can pitch the researcher out of the relative comfort of an established ethical position, or methodological approach, by introducing a condition of instability to the research endeavor that must be resolved" (Whiteman, 2006, p. 113). As I researched teachers who I view as a type of activist, it was plausible that, as a participant I could have been offered the opportunity to participate in civil disobedience that is of questionable legality. This type of situation is not without precedent in anthropological and ethnographic fieldwork. Therefore, it was a possibility of which I must be aware while being cognizant of the fact that I could not have known, for certain, how to respond until the situation had arisen. However, this situation did not arise during my study.

Methods

Many types of ethnographies address use of digital information and communication technologies. Nevertheless, I utilized netnographic methods to determine sources of data as well as their collection and analysis, even though it might not appear to be an obvious candidate. Netnography has often been associated with and used by those interested in mass marketing. Therefore, it is a potential tool for corporate business interests, those that seek to perpetuate neoliberal education reforms and policies, which are the same interests I see as being partially responsible for the issues in education that this study sought to address. It reminds me of what Lorde (2003) said "What does it mean when the tools of a racist patriarchy are used to examine the fruits of that same patriarchy? It means that only the most narrow parameters of change are possible and allowable" (p. 25). It is difficult to use acritical approaches as a means of self-critique.

For that reason, I only used the aspects of netnography that were essential to my research and the online communities that I sought to understand. I used netnography mainly because it provided data collection methods that are compatible with a critical ethnographic perspective. Netnography uses three types of data: archived data, which is data from shared cultural interactions that have happened in the past; elicited data, from interviews and communal interactions in which the researcher participates; and fieldnote data recorded in reflective and observational journals (Kozinets, 2015). Netnography also provided methods for performing field observations which are addressed in a following section.

Data Sources

For the purpose of this study, data were categorized as being either fieldnote, elicited, or archival. Sources included social media profiles, blogs, personal websites, personal communications, interviews - which were conducted after having participants sign a consent form (see Appendix A), and demographic surveys.

Fieldnotes. Fieldnote data came from reflective and observational journals. All of these data were written down by myself as the researcher. I had a total of four journals in which I wrote during the formal research process. One was for journalistic (not-so-thick) observations, another was be for intensive (thick) observations, a third was for reflective comments (and was informed by both reflective comments made during intensive observations and reflections made *after* journalistic and intensive observations), and a fourth will function as more of a diary in which I will record my feelings and emotions about the overall research project. In general, it did not provide direct quotes or generate theory for my analysis. I wrote in this diary daily during periods of data collection and

data analysis. The vast majority of reflective fieldnotes were building theory from observations (Kozinets, 2015, p. 189). Reflective fieldnotes asked questions such as: What is going on? What is connected? What is new? What is meaningful? Kozinets (2015) advises that the researcher "[l]et the reality of what you are actually perceiving to appear to you mirrored back through reflective notes of whatever it is you choose to record" (Kozinets, 2015, p. 189).

Carspecken (1996) describes not-so-thick journalistic observations as being those that occur in places such as the school hallways, "teachers' lounge, homes, neighborhood, and park" in order to understand the community of which a classroom in a particular school was a part (p. 45). I conducted these types of observations in the periods before and after scheduled Twitter chats and teach-ins. Thick descriptions occurred during short periods of intensive observation. While they were being made, I wrote what I observed.

Thick description has several components and qualities. For the purposes of my study, it was not merely concerned with speech acts, but also with "body acts and body postures" (Carspecken, 1996, p. 47). While bodily acts and postures might not seem like something that is observable in text-based online places, symbolic representation via non-text characters, called emoji, are often used to convey body postures by depicting a hand with a thumb sticking up to signal affirmation and/or approval, a flexed bicep to signal strength, or "praying hands" to signal hope.

In my study, thick descriptions were written during Twitter chats and during high-traffic portions of teach-ins, which tended peak between 6 a.m. and 10 a.m. mountain time. Before thick description begins formally, I recorded context information such as the setting of the observation, the people who are present, and the time at which the

observation began. It was also important to continue to record, frequently, the times at which key events happen. For the purpose of my study, thick description utilized a low-inference vocabulary which means that non-objective inferences (or claims that cannot be verified by observation from a person who is, generally, able bodied and able minded) are qualified with statements such as: “it seems”, “appears to be”, or seems “as if” (Carspecken, 1996, p. 47). Additionally, my observer comments (OC), were placed in brackets with the code [OC], were my “speculations about the meaning of what is occurring”, which were written into fieldnotes and observations (p. 47). Observer comments were one of the first forms of data analysis to occur in my study, and they are addressed in greater detail shortly. Lastly, written observations were transcribed into a word processer so that fieldnotes are optimized for keyword searches, copying and pasting, and subsequent analysis.

Elicited data. Elicited data were the second main source of information. Many elicited data were gleaned during interviews. For the purpose of this study, elicited data were gleaned from demographic surveys that were completed by those selected to be participants in my study (see Appendix B for a list of demographic survey questions). Interviews had two portions: the main interview itself (see Appendix C for a list of interview questions), and member checking which is discussed in greater detail in relation to measures taken to strive toward data validation. Carspecken (1996) favors face-to-face interviews (audiovisual and synchronous) as opposed to what seem to be surveys that “self-report” instrumental and operational definitions. Three interviews were conducted over Skype and Google Hangouts, platforms that allows for audiovisual,

synchronous communication. Three interviews were conducted via cellular phone. All interviews were recorded with an audio-visual program called OBS.

Demographic survey questionnaire. My demographic survey questionnaire contained a total of 12 questions from five domains that asked close ended questions regarding personal information, educational background, professional experience, participation in online communities, and personal use of digital technologies. Questions one through eight, as well as questions ten and eleven were used to address my first research question. Questions nine through 12 were used to address my second research question.

Interview questions. During one-on-one interviews, I asked a question from each of the six topic domains and follow up questions from the list on 19 question provided in Appendix C. I asked questions pertaining to experience, knowledge, sensory experiences, opinions/values, feelings, and classroom impact. The first five domains were based on Patton's (1990) six basic types of open-ended questions. Patton (1990) also included a domain related to demographic questions. I did not need to ask these types of questions during interviews because I gleaned this information from my participants' answers to my demographic survey questions. For each topic domain, I began by asking an open-ended question before asking probing follow-up questions.

Archival data. Archival data were considered any data, that were publicly available online, which were related to my study that I did not play a role in generating. One of the most significant determinates of what is considered archival data was time. Data created prior to the time at which I begin eliciting data from participants, as well as data for which I did not participate in its creation, was treated as archival. For ethical

reasons, I avoided any data that I played a role in generating prior to IRB approval, as I likely had my study in mind when I created the data. Utilizing it could appear to be an attempt to circumvent IRB approval. For the purpose of addressing my second research question, I collected data pertaining to relevant hashtags found in online places.

The division was also being implemented for ethical reasons. I interacted within the communities being explored in this study prior to reaching stage three of data analysis, and prior to obtaining IRB approval. Interacting in this community and with potential participants prior to receiving approval was acceptable because Twitter is a public space and interactions mediated by it can be viewed in a manner similar to giving a live on-air radio interview or submitting a written work to an in-print publication. Twitter allows users to decide who has access to their feed which is a compiled list of all information that a user has posted to Twitter. Twitter also keeps transcripts of its users' text interactions, as far as I can tell this feature cannot be turned off, as it would render Twitter, in its current form, useless. Therefore, Twitter and other social media platforms provided me with myriad sources of data. I had social-media based discussions in regards to online communities with potential participants. Any information from these discussions used in my research would have been treated as personal communications requiring approval of the individual(s) with whom I had the conversation. However, the situation did not arise during the course of my study. Archival data were also collected to address research question two. In order to address that question, I collected data pertaining to a hashtag and the various non-human actors that proliferate the hashtag and sustain the environment in which the online community exists.

Data Collection

First, stage one was conducted from May to August of 2017, roughly coinciding with the summer academic semester. Next, stage two of data analysis and data validation was conducted from September to December of 2017, roughly coinciding with the fall academic semester. During this stage, I did not collect any new data because the research methodology that I employed does not call for data collection in stage two. Then, stage three was conducted from January to April of 2018, roughly coinciding with the spring academic semester. Afterward. stage four was conducted from September to December 2018, roughly coinciding with the fall academic semester. Lastly, stage five was conducted from January to April of 2019, roughly coinciding with the spring academic semester. For the same reason as stage two, no new data were collected during this stage.

Stage one. When employing a critical ethnographic perspective, the procession from data collection to analysis is not linear. It is a back and forth process. While it has five stages, not all stages require data collection. Rather, data collection occurs during stages one, three, and four (Carspecken, 1996). See Table 2 for a detailed explanation of the various types of procedures for data collection, analysis, and validation that occur during the five stages of my study.

During stage one, I began to compile my primary record through the collection of data from observations that were as unobtrusive as possible and through examining public records. During stage one, I observed but did not participate in Twitter chats and teach-ins, observing exchanges that occurred over social media, and hashtags that were trending among community participants at the time. I also looked for content that was previously created and/or shared by participants.

In stage one, I collected three main types of data. The first two types, journalistic observations and intensive observations, were gleaned during my earliest foray into the field, prior to interaction with any potential participants. The third type of data that I collected was archival data. For the purpose of my first research question, I gathered archival data from the microblogging website Twitter. I looked for relevant information to help me contextualize the online places of which I sought to gain a better understanding in my study. Using Twitter's built-in search feature, general purpose search engines like Google and Bing, and social media search engines such as Social Searcher, I began performing keyword searches for hashtags used in previous teach-ins and Twitter chats (e.g., #SaturdaySchool, #WhyArtMatters, #EduColor, etc.) and searching for the publicly available Twitter feeds of people who participate on online communities of teachers who operate as transformative intellectuals.

I also looked for archival data generated by online communities of teachers who participate in Twitter chats with the hashtag #EduColor, and generated by online communities of teachers who participate in teach-ins over Twitter with the hashtag #SaturdaySchool. I collected archival data from the beginning, middle, and end of the school year. I also collected archival data that was created during the summer. I looked for data created during times when use of the hash tag was more frequent and times when use of the hash tag was less frequent.

During stage one of data collection, I conducted one hour of observations in an online community in which participants partook in Twitter chats and one hour of observations in an online community that held teach-ins over Twitter. The first hour of observations occurred when the community was not having a Twitter chat and during

non-peak hours of a teach-in. During each of these initial one hour observations, I conducted at least three, five-minute-long intensive observations. I also conducted one hour of observation during a Twitter chat and another hour of observations during peak hours of a teach-in on Twitter. Interviews were recorded and transcribed by myself, the researcher. After transcription, I coded and analyzed the data following the procedures explained for stage one and stage two of data analysis.

Stage two. During stage two, no new data were collected. Rather, I used data that I collected during stage one.

Stage three. Stage three marked a turn toward the generation of dialogic (elicited or co-created) data gleaned, primarily, through participation in a Twitter chat and a teach-in over Twitter, and interviews (Carspecken, 1996, p. 154).

During stage three, I participate in one Twitter chat and one teach-in over Twitter. During this time, I interacted within each community as a typical participant would. Normally, it might not have been realistic, as a researcher, to expect to be able interact like typical participant after conducting only two field observations of a particular community. However, I already have access to both the #SaturdaySchool and #EduColor communities, as I have been participating in them since the fall of 2016.

In my study, interviews needed to fulfill two functions. I began interviews by introducing myself briefly, before moving on to the main portion of the interview. Carspecken (1996) provides an interview protocol. Based on Patton's (1990) six types of basic questions, I have formulated "several lead-off questions, each designed to open up a topic domain" with an accompanying list of "follow-up questions for each topic" (p. 156-157) that I wanted my interviewee to address (see Appendix C). Carspecken (1996)

iterates “the important point [is] that the way one responds to the interviewee is much more important than the wording” that they use for questions (p. 158). He then provides a typology of interview responses from “bland encouragements” to “high-inference paraphrasing”, characterizes the purpose of each responses, and explains when to use them. These responses informed my interviews for this study.

Stage four. Stage four was analytical and involved discovering the social systems-at-large that related to the special social site and cultural group being studied. For my study, this stage was fairly extensive. While the community that I studied was based on a website, as a social site it encompasses parts of other social media sites, such as Pinterest, Facebook, Instagram, and blogs as well as traditional media websites such as the *New York Times*, the *Wall Street Journal*, and the *Huffington Post*. This stage could have included the use of techniques and theoretical models. For this stage, I needed to collect archival data related to the hashtags that I analyzed in detail for my second research question as well as the various non-digital entities that were used to proliferate that hashtag and sustain the environment in which my online community operated. I also looked for archival data generated by online communities of teachers who participate in Twitter chats with a hashtag other than #EduColor, and generated by online communities of teachers who participate in teach-ins over Twitter with a hashtag other than #SaturdaySchool. I collected archival data from the beginning, middle, and end of the school year. I also collected archival data that was created during the summer. I looked for data created during times when use of the hash tag was more frequent and times when use of the hashtag was less frequent.

Stage five. During this stage, no new data were collected.

Data Analysis

Unlike data collection, data analysis occurs during every stage of this type of study. Methods of data analysis are conducted to examine the validity of claims that are contained within fieldnotes and observations.

Stage one. Stage one data analysis began when observer comments were incorporated into fieldnotes and observations. Reflective journal entries were also an aspect of stage one data analysis. However, in-depth analysis began with preliminary reconstructive analysis in the following stage. After journalistic and intensive observations, I wrote reflective journal entries answering the types of questions listed in my study's previous section on fieldnotes.

Stage two. After stage one analysis, I began the process of preliminary reconstructive analysis. This process consisted of low-level coding, initial meaning reconstruction, and pragmatic analysis. One of the first aspects of preliminary reconstructive analysis to happen was low-level coding of the primary record, which consisted of fieldnotes, observations, and reflective journal entries at this point in my study.

Low-level coding does not require extensive abstraction. Some low-level claims are "primarily objective in nature" and refer to "activities that are open to multiple access", or activities that any able-bodied/able-minded person without privileged access can verify objectively with one or more of their senses. Other low-level codes "introduce some interpretations supportable through horizon analysis" which will be explained shortly (Carspecken, 1996, p. 147). Coding procedure requires "reading through the primary record, slowly and repeatedly" while looking for words and phrases that stand

out (Carspecken, 1996, p. 149). When I do encounter something "worthy of a code", I designated a number or letter for the new code; make a note of the file, page, and line number its first appearance in my primary record; and added that code to my running master list of codes (Carspecken, 1996, p. 149).

In a manner similar to observer comments and low-level coding, initial meaning reconstruction requires the utilization of "low levels of inference" (Carspecken, 1996, p. 149). Meaning reconstruction began by looking for possible underlying meaning in primary record materials after the start of low-level coding. After doing so, I selected several segments from my primary record and added detailed explanations of the "tacit methods of meaning" that "may underlie the interactions recorded" (Carspecken, 1996, p. 95). Meaning fields try to identify meaning that are often used without being articulated. Therefore, I could have constructed meanings that were different than my participants'. Initial meanings that I reconstructed contained "and/or" statements to denote ambiguity. This stage of analysis was prone to mistakes and will be verified and collaborated through additional data collection, analysis, and validation in subsequent stages of research.

The penultimate step of preliminary reconstructive analysis that occurs before high-level coding is pragmatic analysis. Pragmatic analysis is based on the idea that "action, rather than perception" is "most primary in experience" (Carspecken, 1996, p. 103). It was based on the idea that a "perception is knowledge-imparting only when it becomes a possible reference of communicative acts", and that meaningful communicative acts exist on horizons, or continua, that consist of "intersubjective assumptions…about how others in first-, second-, and third-person positions could

experience the act" (Carspecken, 1996, p. 103). It is also based on the idea that communicative acts occur during social interactions in which "actors must adopt roles", "employ styles of interaction", and "be cognizant of power relations" (Carspecken, 1996, p. 104). Interactive power relations will be explored after discussing the various axes upon which horizon analysis is based.

Pragmatic analysis includes placing acts into various categories that exist on a continuum. Acts and statements are based on claims of shared access (objectivity), privileged access (subjectivity), or normative-evaluative conditions (the way the world *ought* to be). Shared access is something that most able-bodied and able-minded adults could sense or verify, such as saying "There are four, and only four, chairs in my office" (Carspecken, 1996, p. 119). It refers to claims about the world that most people can experience. The next is privileged access. Subjectivity is associated with privileged access. It includes inner feelings that might only be subconscious, such as claims about "my", "her", "your" world. The third type is normative evaluations, which are statements about the way the world ought to be, such as claims about what is "proper, appropriate, and conventional", or rule-like forms of the way "our" world *ought* to be (Carspecken, 1996, p. 83).

I selected passages from my fieldnotes and observations that seemed particularly significant and determined into which of following categories of "reference and claim" should be categorized. Carspecken (1996) identifies "five main categories of reference and claim within the horizon of meaningful acts": (1) claims that an act is "intelligible", (2) claims that an act is "socially legitimate or appropriate", (3) claims "that the actor has a certain subjective state (feelings and intentions) at the time of acting, (4) claims "that

the actor has a certain identity", or (5) claims "that a certain objective state of affairs exist" (p. 104). There is also a typology of interactive power. Claims will generally be based on normative power, or scenarios where "a subordinate consents to [the] higher social position of a superordinate because of cultural values"; coercive power which is utilized when a "subordinate acts to avoid sanctions imposed by a superordinate"; interactively established contracts, which are established when a "subordinate acts for returns of favors or rewards from a superordinate"; and charm, which occurs when a "subordinate acts out of loyalty to the superordinate because of the latter's personality" (Carspecken, 1996, p. 130).

The validity of meaningful acts exists on a continuum ranging from foreground, to intermediate, to backgrounds, to deeper background. Foreground validity refers to the "main point of the act" the meaning intended by the person who made the statement; intermediate validity refers to claims upon which foregrounded statements are based, which can be considered the response that someone might give to defend a foregrounded claim; backgrounded claims "involve general principles, implicit theories, worldview assumptions, and other things that character rise and characterize an entire culture"; whereas deeper backgrounded claims which require an understanding of "many diverse act carrying similar backgrounds to gain some confidence in bringing out those backgrounded assumptions" (Carspecken, 2012, p 51-52).

Carspecken (1996) recommends against establishing operational definitions for these types of terms prior to research as it has a tendency to result in distortions of power that favor the researcher. Instead, I sorted claims into these categories based on information gleaned during my observations, fieldnotes, and data analysis. Once I have

performed pragmatic analysis and interactive power analysis on selected acts from my primary record, I began high-level coding.

High level coding is “needed to generalize findings that have emerged from the methods of data analysis” thus employed in my study (Carspecken, 1996, p. 148). It is useful for determining findings to be presented in the final presentation of research. These codes should “match statements made by participants during” the member check portion of my interviews conducted for stage three data collection (Carspecken, 1996, p. 148).

Stage three. My stage three of data analysis employed the same methods of data analysis, this time applying them to transcripts of interviews conducted during stage three of data collection. Once I coded and analyzed interview transcripts, I began to code reorganization to produce a hierarchical scheme of low- and high-level codes.

Stage four. The viable system model was used to collect and analyze the data during stage four of data analysis and to present the finding for my second research question. Interestingly, the viable system model is based on second-order cybernetic thought, or cybernetic management which is the study of communication and control in living and non-living “entities”. It is based on the way that machines, humans, and other biological organisms function viably. The viable system model compliments actor-network theory with an emphasis on the potential agency and functions in systems that are carried out by non-living agents. It also compliments post-humanist thought and is helpful for understanding the non-living components that sustain the systems or networks that comprise the online places.

The viable model system has five tiers or levels, implementation, co-ordination, control, intelligence, and policy. The first tier is responsible for "products or services implied by the organization's identity…The organization's products and services are produced at different levels of aggregation by its embedded primary activities" (Espejo & Gill, 1989, n.p.). Co-ordination, the second tier exists "to co-ordinate the interfaces of its value-adding functions and the operations of its primary sub-units…co-ordination is necessary between the value-adding functions as well as between the embedded primary activities;" (Espejo & Gill, 1989, n.p.). Control is the third tier because "[a]lthough effective use of the communication channel can considerably lessen the requirement for supervisory control, two-way communication between sub-unit and meta-level unit remains a prerequisite for viability" (Espejo & Gill, 1989, n.p.). The third tier also performs audits occasionally by inquiring if aspects of the system are doing what they are supposed to be doing (Espejo & Reyes, 2011). Intelligence is the fourth tier and its purpose "is the two-way link between the primary activity i.e. Viable System) and its external environment. Intelligence is fundamental to adaptivity" because "it provides the primary activity with continuous feedback on marketplace conditions, technology changes and all external factors that are likely to be relevant to it in the future" and "it projects the identity and message of the organization into its environment" (Espejo & Gill, 1989, n.p.)

Policy is the fifth tier and it bears a longer explanation because it provides "closure to the system as a whole"; it "is highly selective in the information it receives"; and "the selectivity is largely achieved through the activities and interactions of the" third and fourth tiers (Espejo & Gill, 1989, n.p). Its primary functions "are to provide clarity

about the overall direction, values and purpose of the organizational unit; and to design, at the highest level, the conditions for organizational effectiveness" (Espejo & Gill, 1989, n.p.). It functions as "a final sanity check against direction, values and purpose after extensive debates and decisions have been carried out within and between the" third and fourth tiers (Espejo & Gill, 1989, n.p.). I will use VSM to determine the roles of non-human actors in maintaining the network in which online communities exist. The purpose of this stage is to "discover specific system relationships, such as relationships between a school and its surrounding community, or a youth culture and the popular media" (Carspecken, 1996, p. 173).

In this instance, I looked at the relationship between online sites where communities of transformative teachers partook in teach-ins and Twitter chats, and the larger cybernetic ecosystem in which the communities exist. I looked for different actors and entities that sustain the networks that support these communities by using VSM as a diagnostic tool for data analysis. I also compared the archival data I collected pertaining to #SaturdaySchool with the archival data that I collected from #EduColor to see if the communities had similarities in terms of composition and functions.

Stage five. After completing stage four data analysis, I began my fifth and final stage which required "using system relations to explain findings", which Carspecken (1996) argues that in this stage, well-conceived, analyzed, and presented research results in "reasons for the experiences and cultural forms" that the researcher experienced that have "to do with the class, race, gender, and political structures of society. Often, it is this fifth stage that really gives one's study its force and makes it a contribution to real social

change" (p. 43). The results of this step were the findings of this study, which are addressed in a subsequent chapter.

Table 2

Data Sources and Analysis by Research Question

Research Questions	Data Collection	Data Analysis
Q1 What are the shared values/beliefs and behaviors of K-12 classroom teachers who operate as transformative intellectuals in online places?	Archival data from my participants' Twitter accounts; Observations of participants' interactions Demographic survey questions 1-8, 10-11; Interview questions 1-19;	Observer comments; Low-level coding Meaning field construction; Pragmatic horizon analysis; Interactive power analysis; High-level coding;
Q2 What role do non-human actors play in sustaining the systems or networks that comprise the online places in which teachers operate as transformative intellectuals?	Demographic survey questions 9-12; Archival data from my participants' social media accounts (excluding Twitter); Archival data from other teacher communities on Twitter;	Viable system model; Analysis for components of the community that facilitate implementation, co-ordination, control, intelligence, and policy;

Data Reliability

The reliability and validity of research findings are "concerns that can be approached through careful attention to a study's conceptualization", specifically "the way in which the data are collected, analyzed and interpreted" (Merriam, 2009, p. 210). As is explained below, a study conducted with a critical ethnographic perspective

includes myriad measures that are taken to help researchers strive toward validity. In many ways, the methods increase in rigor as research advances through the five stages.

Data Validity

A critical ethnographic perspective is compatible with Patti Lather's (1986) concept known as cathartic validity. It refers to the degree to which a research allows [themself] to change and grow through field work", and "to change and grow in ways that often challenge oppressive cultural forms" (Carspecken, 1996, p. 160). Stages one through four contained procedures for data validation. *Data Sources and Analysis by Research*

Stage one. Measures taken to strive toward validity are not as intensive as measures taken in later stages. In stage one, measures are mainly concerned with establishing an accurate naturalistic social interaction" and by taking measures to have multiple media formats in which I

record interactions, such "in notebooks, audio tapes, and (sometimes) video tapes" (Carspecken, 1996, p. 88).

As mentioned previously in my data collection section, I documented interactions in journals that were transcribed into word documents. I conducted my interviews with Laura, Carolina, and Alicia over Skype and Google Hangouts. I conducted my interviews with Georgia, Ed, and Olivia via mobile phone and recorded audio with a screen-capture software program called OBS that can be used to record audio-visual interactions.

Stage two. During stage two, methods of data validation became more involved. It marked the beginning of the implementation of methods that I continued to employ through all subsequent stages of my study. During stage two, validity measures focused

mainly on claims that I had identified as being normative-evaluative in my primary reconstructive analysis. In stage two, I utilized prolonged engagement to improve my "capacity to assume the insider's perspective" to improve the validity of my study (Carspecken, 1996, p. 141.

I also used strip analysis. This procedure was used to validate meanings and cultural themes gleaned during preliminary reconstructive analysis. Reoccurring meanings and themes can shed light on the routines and interactions that I observed. For strip analysis, I used short excerpts, or "strips" from my primary record (such as fieldnotes and journals) that described an event, then looked to see if that description was congruent with meanings and themes that I found during preliminary reconstructive analysis and high-level coding in stage two of data analysis.

In order to prevent conformation bias, I also employed negative case analysis. During this process, I reread primary record documents looking for excerpts from observations that seemed to challenge or contradict the meaning and themes that I identified during stage two of data analysis.

Stage three. Stage three data validation utilized procedures to examine data collected during interviews as well as the information gleaned from analysis of interview data during stage three of my study. After conducting the topic domain portion of the interview, I proceeded to conduct a member check on reconstructions from stage two "to equalize power relations" by "showing the [participant] some of [my] reconstructions and, perhaps, the segments of primary record upon which they are based" (Carspecken, 1996, p. 141).

In addition to procedures used for data validation in stage two, I will employ consistency checks to verify that my observations of events do not contradict my interviewees' descriptions of the same events. Discrepancies might suggest a memory problem, "a lack of veracity", or a misperception by the participant that should be able to be verified or dismissed by reviewing audio and/or video recordings of the event in question (Carspecken, 1996, p. 166). During stage three of data validation in my study, I also checked individual interview transcripts for internal consistency. For instance, a participant could have articulated a dislike of something early in an interview, but then described numerous aspects of it that they believed to be beneficial at a latter point in the interview. This would not have necessarily be viewed as grounds to discredit the statements of the interviewee. It could have indicated a misunderstanding of a question or – perhaps – a more nuanced, love-hate relationship with something that they viewed as a necessary evil.

In stage three of data collection, I checked myself by having participants "use and explain the terms that they employ" when interacting in teacher communities in online places (Carspecken, 1996, p. 166). Stage three also signaled the beginning of member checks. Toward the end of interviews, after asking the questions in Appendix C, I conducted member checks by presenting my interviewees with some of my preliminary reconstructions of meaning and themes from coding, and asking them for their feedback. I also briefly summarized my initial impressions of our interview and invited my interviewee to challenge any discrepancies between their understandings of my reconstructions and our interview.

It is not uncommon for discrepancies to occur. In my study, they arose during my interview with Olivia when I asked her about my understanding of the values and beliefs held within #EduColor. As a result, I returned to my primary record to look for explanations for the discrepancies. I cannot reconcile the discrepancies, so I conducted more observations, collected more data, and analyzed more observational and archival data.

Stage four. After completing stage three data validation, I moved on to sage four of data validation. During stage four data validation, I looked for a match between the meanings and themes in my findings from stage four and other research pertaining similar meanings and themes. Like my previous stages of data collection and data analysis, I intended to invite my participants to provide data validation. However, I was unable to do so.

Stage five. No data validation occurred during stage five.

Summary

This research study was based on a researcher stance that is based on post-humanist thinking, informed by Haraway's cyborgs, with some influence from punk and hacker values. With this study, I hope to gain a better understanding of both the human and non-human aspects of the systems and networks that are sustained by the Internet as well as digital information and communication technologies. I will do so by entering the field by going into online places used as sites of resistance by classroom teachers who operate as transformative intellectuals striving to confront neoliberal discourses and teach equitably.

Table 3

Data Collection, Analysis, and Validation for Stages 1-5

	Data Collection	**Data Analysis**	**Data Validation**
Stage One: Building a Primary Record **(May - Aug. 2017)**	Fieldnotes from observations, journalistic observations, and "thick descriptions"; Archival data from Twitter;	Observer comments; Low-level coding; Reflection; Short, intensive analysis;	Passive Observation; Recorded Interactions; (proceed to stage two data collection);
Stage Two: Preliminary Reconstructive Analysis **(Sept. – Dec. 2017)**		Low-level coding; Meaning fields, pragmatic horizon, and interactive power analysis; High-level coding;	Focus on normative-evaluative claims and recognition rather than observation; Techniques include prolonged engagement, strip analysis, and negative case analysis; (proceed to stage three data collection);

Table 3, continued

	Data Collection	**Data Analysis**	**Data Validation**
Stage Three: Dialogic Data Generation **(Jan. – Apr. 2018)**	Demographic surveys; One-on-one interviews;	Low-level coding; Meaning fields, pragmatic horizon, and interactive power analysis; High-level coding;	In addition to stage two validity measures, check for internal consistency of individual interviews, for consistency between interview statements and actions during observations; Check myself by having subjects explain terms in their own words; (proceed to stage four data collection);
Stage Four: Discovering System Relations (Research Question 2) **(Sept. – Dec. 2018)**	Archival data from websites other than Twitter; Archival data from other teacher communities on Twitter;	Viable System Model's five tiers: implementation, co-ordination, control, intelligence, and policy;	Looked for a match between the meanings and themes in my findings from stage four and other research pertaining similar meanings and themes;
Stage Five: Using System Relations to Explain Findings **(Jan. – Apr. 2019)**	(none)	My findings in this stage could be used in future research "to alter, challenge, and refine macro-sociological theories themselves" (Carspecken, 1996, p. 172).	(none)

CHAPTER IV

FINDINGS

The following chapter restates the research questions that are addressed in this study and provides a brief explanation of the online places in which the study took place, a short description of my participants' demographic information, and my findings for research question 1 and research question 2. This study had two research questions:

Q1 What are the shared values/beliefs and behaviors of K-12 classroom teachers who operate as transformative intellectuals in online places?

Q2 What role do non-human actors play in sustaining the systems or networks that comprise the online places in which teachers operate as transformative intellectuals?

Findings for research question 1 are separated for each online community – #SaturdaySchool and #EduColor – and are categorized based on the six topic domains from the interview questions found in Appendix C. First, I provide an explanation of values and beliefs found in #SaturdaySchool pertaining to topic domains two, four, and five, as well as an explanation of values and beliefs found in #EduColor from the aforementioned topic domains, and an explanation of values and beliefs shared by both groups. Then, I provide an explanation of behaviors found in #SaturdaySchool addressing topic domains one, three, and six, as well as an explanation of behaviors in #EduColor from the aforementioned topic domains, and an explanation of behaviors shared by both groups.

I used the viable system model (VSM) to analyze data and determine findings for research question 2. I also use VSM to present my findings. In order to gain a better understanding of the online places in which classroom teachers operate as transformative intellectuals, I used VSM to analyze the role of non-human entities in regards to the #SaturdaySchool hashtag, a weekly #SaturdaySchool teach-in, and the hashtag communities #SaturdaySchool and #EduColor.

My Definition of Online Places

In my study, I explored online places centered around the hashtags #SaturdaySchool and #EduColor, specifically use of the aforementioned hashtags by users of the social media website Twitter. Online places, for the purpose of my study, are defined as ecosystems in which both human and non-human actors interact with each other in interconnected ways. For instance, to access an online place where there are hashtag communities, such as #SaturdaySchool and #EduColor, (e.g., to interact with either of the aforementioned hashtags on Twitter), a person could access the social media platform Twitter via a smartphone mobile app that is connected to the Internet via a combination of both wireless internet connection and the phone's cellular signal connection.

In addition to living organisms (Twitter users), the ecosystem also has several non-living components, such as: the smartphone, the mobile app, the internet/cellular data connection, and the specific hashtag itself. People create some aspects of this ecosystem, such as choosing which type of device to use, or whether they decide to use the mobile app or a web browser to access Twitter when using either a tablet computer or mobile device. The decision impact the features that are available to a user. For instance, unlike

its website, Twitter's mobile app has a feature that allows users to bookmark tweets easily (in a manner similar to the way that a web browser can bookmark websites), but it does not allow users to press "enter" to start a new line of text when composing a tweet. It is possible to bookmark tweets from Twitter's website and to post tweets that have been formatted to contain multiple lines of text with Twitter's mobile app, but both require additional effort. In the former situation, a user must type the characters "m." at the beginning of the URL for the tweet to convert it into a mobile website address that can then be bookmarked. In the latter situation, a user must draft a Tweet in a note taking or word processing app – such as Notes, Stickies, Microsoft Words, Google Docs, etcetera – and then copy and paste the formatted text into the mobile Twitter app.

When accessing Twitter via web browser, the opposite is the case. Users are not able to easily bookmark tweets, but they can press enter to start a new line of text. Sometimes a person's decisions could be impacted by issues not directly within their control. For instance, a weak wireless internet signal on a tablet computer that cannot access a cellular data connection might result in a person having to use a mobile phone to be able to participate. Similar to the way that people can plant flora in an ecosystem and populate it with fauna, but they cannot directly significantly influence an individual weather event or the geological activity happening within an ecosystem.

Online places do not exist in opposition to the "offline" world; online places are always components of the offline world. Someone could, for instance, show a photo or video from Twitter or Instagram to the other people who are sitting with them at a table in a restaurant or café. It is difficult, if not impossible, to discern the demarcation line between the purely online and the purely offline. While events can occur independently

in the online world, it is almost certainly at least indirectly impacted by events in the offline world. Additionally, people accessing the online world clearly continue to exist temporally in the offline world.

#SaturdaySchool

Saturday School almost always stylized as "#SaturdaySchool" (occasionally typed as #Saturdayschool) is a weekly, social justice teach-in hosted by Laura. Laure is also the founder of #SaturdaySchool and was a participant in my study. More information about Laura is provided below. Topics are related to social-justice and human-rights issues. While the conversation at #SaturdaySchool "never ends", new topics are discussed each Saturday, and a different secondary hashtag, which now typically – but not always – begins with the prefix "SoJust-", is used for each topic. For instance, a February 2019 discussion about ableism used the hashtag "SoJustAble". Some people who participated in this particular teach-in included the hashtag #SoJustAble (as well as the hashtag #SaturdaySchool) in tweets pertaining to the conversation about ableism. Participants also used the hashtags #SaturdaySchool, #SoJustAble, and #EndAbleism to promote this particular weekly teach-in's topic.

Collectively, weekly hashtags are referred to as the #SoJustHashtags. While there is only one topic per week, sometimes a single tweet contains more than one of the #SoJustHashtags. During the #SoJustAble conversation, people also used the hashtag #EndAbleism, which is used in contexts outside of #SaturdaySchool. This is explained in greater detail in a subsequent explanation about the evolution of #SaturdaySchool. Additionally, an individual tweet/shared resource could relate to the current weekly topic as well as topic(s) from previous weeks. For instance, an online news story about a

student arrested for refusing to recite the Pledge of Allegiance was shared during a February 2019 teach-in pertaining to the myriad social injustices within the U.S. criminal justice system that used the hashtag #SoJustCrime. It also contained the hashtags #SoJustSpeech because it pertains to free speech and #SoJustEdu because it occurred in the U.S. education system (see Figure 2). Weekly topics from early years as well as topics during the first three weeks of January and the last week of December are different, as is explained in a following section.

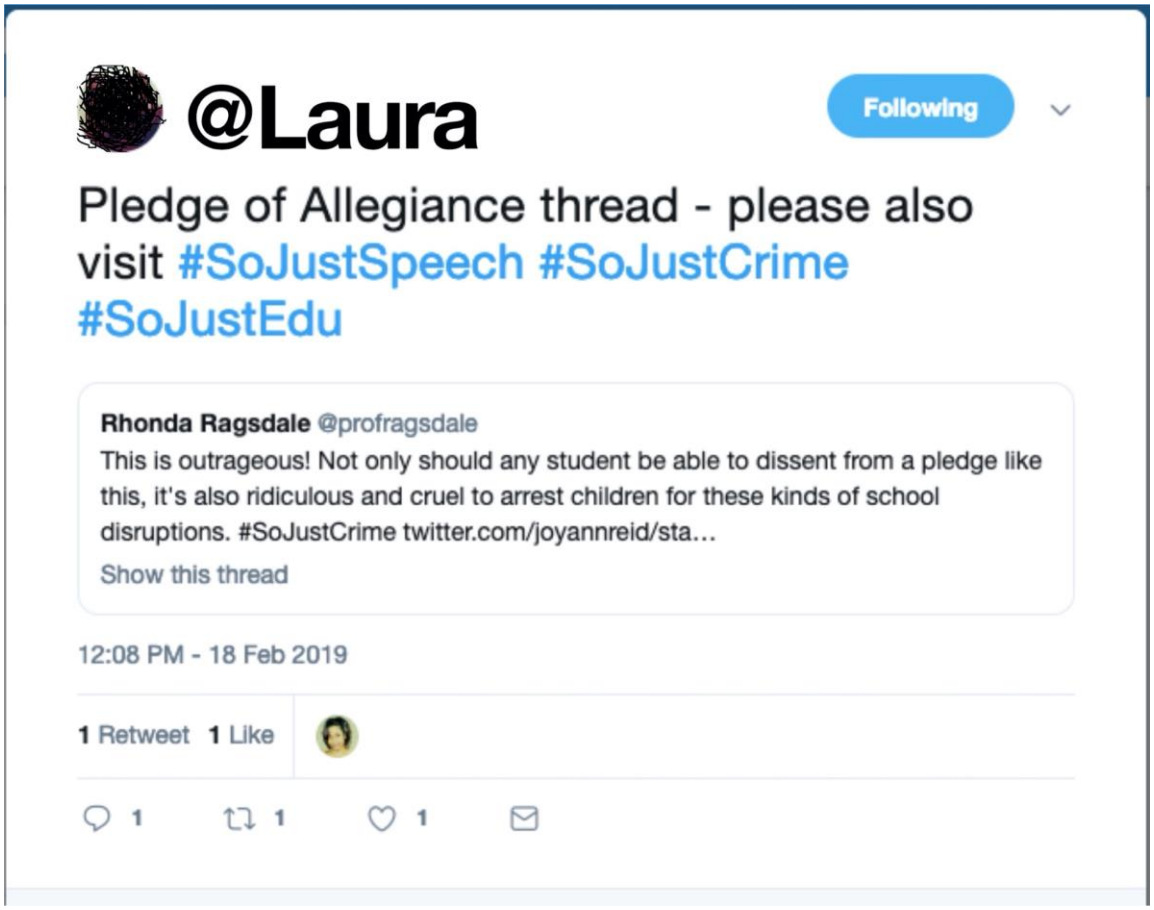


Figure 2. Example of Tweet with Multiple, Secondary, Weekly Hashtags.

Origins of #SaturdaySchool. #SaturdaySchool began as a way for Laura to take a break from the demands of her professional life which included the workload of being an adjunct professor and the course-load of being a full-time doctoral student, as well as

the obligations of personal life which included being a single mother of three then-young children. Laura decided that on Saturday mornings, she would partake in what she described as “academic venting” on Twitter. After a few months, one of Laura’s Twitter followers referred fondly to her weekly rants as “Saturday School”, which led to Laura coining the hashtag “#SaturdaySchool”.

Weekly #SaturdaySchool teach-in topics initially had a focus on higher-education. Some of the first topics were: how to avoid plagiarism in academic writing, how to find reliable resources for research projects, and how to write bibliographies in different formats. While honing its format, Laura vacillated between weekly topics with a narrow focus, such as Martin Luther King Jr.’s speech about Easter; and broad, general topics related to higher-education such as avoiding plagiarism, finding reliable resources, and writing bibliographies.

After a few years of weekly teach-ins, Laura adopted the use of the previously mentioned, secondary, weekly hashtags. Her impetus for doing so was twofold. Firstly, while no other organized groups regularly used the hashtag #SaturdaySchool for teach-ins or Twitter chats, it was and is sometimes still used by schools to promote weekend activities that occur on Saturdays, such as community service projects taking place at high schools, as well as to disseminate information pertaining to disciplinary activities such as Saturday detention. Disgruntled students also used to use the hashtag while complaining about being in detention. However, students’ use of the hashtag on Twitter seems to have declined precipitously after the proliferation of SnapChat and Instagram, social media platforms that are currently much more popular among secondary, grade-level students. The hashtag #SaturdaySchool was also occasionally used in guerilla-

marketing advertisements for companies selling alcohol and pornography. This appears to have declined after recent efforts made by Twitter to filter out these types of tweets.

Secondly, in addition to the unwanted static noise surrounding the hashtag #SaturdaySchool, Laura realized that if someone who followed her on Twitter only followed a few hundred other people (at the time, Twitter allowed users to follow at least 2000 others), then their Twitter feed would be inundated with a deluge of tweets pertaining to #SaturdaySchool, essentially drowning out all other activity on a user's Twitter feed. Laura was concerned that people would "mute" the hashtag #SaturdaySchool (which would prevent them from seeing any tweet with #SaturdaySchool in it) or possibly stop following Laura altogether. To reduce the likelihood of either situation, Laura began using a secondary weekly hashtag so that her followers could mute a weekly topic/discussion without muting *all* future discussions and tweets containing the #SaturdaySchool hashtag.

Originally, Laura used secondary hashtags collaboratively, by incorporating an already existing hashtag – such as the previously mentioned hashtag #EndAbleism. This approach was not sustainable as there was not always a pre-established hashtag pertaining to the weekly topic. Laura's then-teenage Centennial-generation daughter suggested the "SoJust-" prefix, a portmanteau of "social" and "justice". Laura has since adopted the practice of creating new #SoJustHashtags for most weekly topics. A few exceptions are extant. During the last Saturday of December, the topic asks participants to share their favorite weekly topics and #SoJustHashtags from the previous year. In the earlier years, topics of discussion from the first three weeks of January were different as well, as is described in the following section.

Evolution of #SaturdaySchool. As the #SaturdaySchool weekly teach-in evolved into its current form, there were experiments with now-defunct aspects. In addition to weekly teach-ins using the original #SaturdaySchool hashtag, Laura and a few others experimented with the idea of having other weekly teach-ins that were focused on specific geographic locations. In late 2015/early 2016, #SaturdaySchoolHTX, #SaturdaySchoolBmore, and #SaturdaySchoolFlint were used briefly for teach-ins that had topics of discussion pertaining to social-justice issues in those localities.

For many years, a multilingual #SaturdaySchool participant would post Spanish translations of tweets that contained the hashtag #SaturdaySchool. The translated tweets would also contain the hashtag #AcademiaSabatina, which roughly translates to "Saturday School" in Spanish. However, this practice appears to have ended around March of 2017.

Each year, the first three weekly topics of discussion examine the role of music, art, and poetry in social-justice and human rights-oriented activism and education. Laura ascribes value to the perspectives of musicians, artists, and poets and works to ensure that their perspectives are included in #SaturdaySchool. This began during the early years of #SaturdaySchool, before the implementation of weekly #SoJustHashtags. For several years, the first three weekly chats in January used the hashtags #WhyMusicMatters, #WhyArtMatters, and #WhyPoetryMatters. However, in 2018 Laura created #SoJustHashtags to use during the first three chats of the year. For instance, Laura includes #SoJustMusic with #WhyMusicMatters on the first Saturday in January, #SoJustArt with #WhyArtMatters on the second Saturday in January, and #SoJustPoetry with #WhyPoetryMatters on the third Saturday in January. Laura has not told me whether

she intends to continue to use the "#Why-Matters" hashtags, or if she intends to phase them out.

Peak hours of #SaturdaySchool. Early in the week, typically on Monday or Tuesday, Laura and a few others will formally share an announcement of the upcoming topic of discussion and the weekly secondary hashtag. Others will share the announcement informally – that is, without coordinating with Laura. Some of those who share announcements will not actually participate in that weekly teach-in on Saturday. However, they may do so later in the following week.

Figure 3. Example of Typical Participation in weekly #SaturdaySchool Teach-In

While the conversation is ongoing and asynchronous, peak activity tends to occur between 6 a. m. and 10 a.m. mountain time on Saturdays. During the conversation, people tend to ask and answer questions, share resources, and/or discuss the weekly topic in general. Occasionally, a co-host will participate, sometimes in conjunction with an already existing hashtag/activist group such as Resistance Manual. Resistance Manual is

an online, open-source, wiki-style website that presents “truthful and actionable information to empower people to participate in their development” (Resistance Manual website, 2018, n.p.). This website is run by approximately ten activists. However, anyone can submit information and resources related to issues such as LGBTQ equality, immigration, mass incarceration, women’s rights, reproductive rights, and voting rights. Activists running the website then review resources for accuracy and relevancy before publishing them on the website.

When a co-host is present, it is more likely that significantly noticeable activity will occur during peak hours. A co-hosted teach-in is also more likely to have a formal, question-and-answer format. While it was not the case during her collaboration with Resistance Manual, Laura reported at least one instance in which the planned co-host had been less than reliable.

Off-peak hours of #SaturdaySchool. Numerous ways for participation in the teach-in are extant. As shown below in *Figure 3*, people can learn about the #SoJustHashtags when they “[v]isit them and learn from resources posted there”; people can retweet and share what they have learned at the hashtags, and share promoted hashtags on Twitter as well as on other social media platforms; and people can ask questions to get a better understanding of/clarification about arguments. In addition, people can add resources such as articles, books, or documentaries; people can promote the teach-in by sharing the weekly topics and retweeting and sharing the “hashtags, [Facebook] event page, Pinterest board, and other related items on various social media platforms”; and by co-hosting a teach-in.

Figure 4. Ways to Be Part of the #SaturdaySchool Teach-In.

Presence outside of Twitter. #SaturdaySchool also has a digital presence outside of Twitter. As is discussed in a subsequent behind-the-scenes section; planning, promoting, and archiving for #SaturdaySchool takes place on Facebook and Pinterest. Laura also maintains a news aggregate site called Black Towns Radio; as well as Landsman's Conversation Emporium, which is a physical location that began as an antique furniture shop operating from a warehouse in Oklahoma which was reopened as a café/small concert venue in Texas; and Funk and Beans, a blog where she writes blog posts pertaining to social justice and human rights issues. Laura also has a dedicated Twitter account for Funk and Beans. In addition to using it to promote her blog, Laura uses the account to promote #SaturdaySchool as well as to retweet and like tweets pertaining to #SaturdaySchool. The physical location has served as a meeting place for scholars, poets, musicians, and activists. #SaturdaySchool also has an offline presence found in the activism of some #SaturdaySchool participants who use the information that they glean from weekly teach-ins to do door-to-door social justice work in rural areas where residents are predominately socially conservative.

Behind the scenes. Behind the scenes, other social media platforms are used to plan and coordinate new topics as well as to archive resources that have been shared during past teach-ins. In addition to Laura, another participant in this study named Ed, and a third person – who was not able to participate in this study due to time constrains from prior professional commitments – use Facebook event pages and Google Sheets collaboratively to keep track of past topics and plan future topics, coordinating them so that similar topics are not discussed on consecutive weeks. Pinterest boards are used to

archive resources pertaining to previous weeks' teach-ins with a dedicated Pinterest board for each weekly topic.

#EduColor

#EduColor started as a "support group for self-determined advocates of color"; as a movement, it consists of "informed, inspired and motivated educators, parents, students, writers and activists who promote and embrace the centrality of substantive intersectionality diversity" and it "seeks to elevate the voices of public school advocates of color on educational equity and justice" (EduColor website, n.d., n.p.). Monthly chat topics address issues that are pertinent to students and teachers of color. Chats typically last between an hour and an hour and a half. A moderator will usually pose the final formal question toward the end of the first hour. After that, some participants and moderator(s) alike will continue to chat for several minutes. Some participants leave the discussion after answering the final question near the end of the first hour. The hashtag is not always stylized to contain uppercase letters; it is not uncommon for it to be written as #Educolor or #educolor.

Peak hours of #EduColor. Typically, one or two moderators are chosen in advance and are mentioned in promotional tweets in the week of the chat prior to it. Moderators ask pre-determined questions, sometimes via third-party applications such as TweetDeck or HootSuite, both of which have features that allow a user to compose a tweet in advance and schedule it to post at a time and/or date in the future; pose follow-up questions; and respond to participants' statements. Questions are open ended and related to the monthly topic which is also determined in advance. Each chat typically has nine questions, numbered Q0 though Q8. The initial question, Q0, is almost always:

"Introduce yourself and say what you want to get out of the chat." Subsequent questions, Q1 through Q8, relate to the topic of the monthly chat. Some, but not all, users will post their answer as a reply to the tweet that contains the question, others will answer by retweeting and commenting on the tweet containing the question.

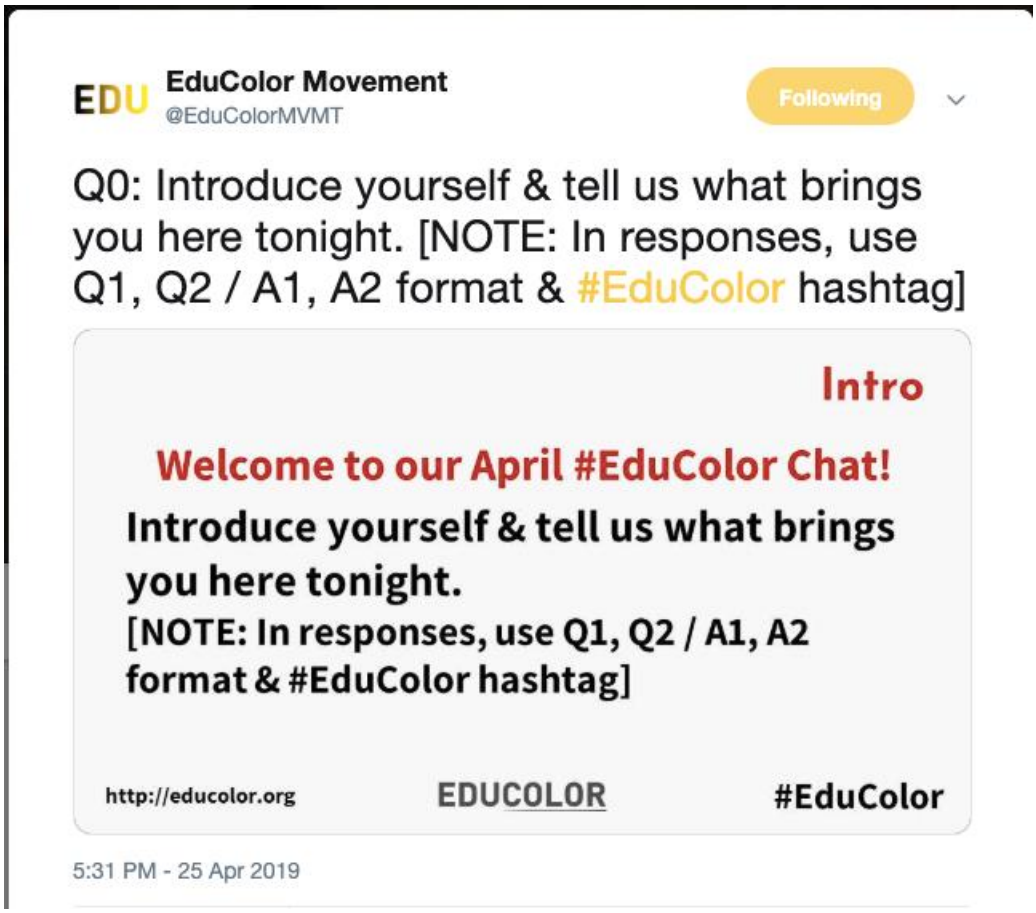


Figure 5. The First Prompt of Most Monthly #EduColor Chats

While the latter approach makes the question more visible on a user's Twitter feed, it restricts some of Twitter's features by not allowing photos or gifs to be included in a tweet. Conversely, the former approach allows users to include photos or gifs. However, the question being answered will not appear in a participant's Twitter feed or in the Twitter feeds of those who follow the #EduColor participant. Answers to questions

are supposed to, and almost always do, end with the hashtag #EduColor and begin by denoting which question is being answered.

Figure 6. Example of Typical Participation in Monthly #EduColor Chat

For instance, answers to the first question will begin with the denotation "A1." or "A1)"; answers to the second question will begin with "A2." or "A2)"; answers to the third question will begin with "A3." or "A3)". The same is not true for responses to answers, regardless of whether it is from a (co)moderator or a participant. The hashtag may be included for effect if the person composing the tweet choses to do so. It is not required, but it is certainly an option.

I was unable to gain the necessary level of access within #EduColor to find out who picks the monthly topics and chat questions. A participant who has moderated, Olivia, reported that after a new question is posted during a chat, moderators will reply to participants' responses. They do so by answering any questions that participants posed,

by asking follow-up questions, and/or by stating general agreement/disagreement with others' statements.

Those who have participated in monthly #EduColor chats reported a pattern of behavior that is similar to that of moderators. If time permits after answering the most recent question and replying to any responses to their answers, participants will then look at others' responses and possibly reply to some of the other responses. They do so by looking at #EduColor's Twitter feed, by searching for most recent uses of the hashtag #EduColor, and/or by looking at the moderator(s) replies to other participants' responses.

Off-peak hours of #EduColor. Outside of monthly chats, the #EduColor hashtag is used in conversations that address topical social-justice issues pertaining to students and teachers of color as well as people from marginalized social groups. Articles written by official #EduColor leadership are disseminated via the #EduColor website and Twitter Lists. Lists are essentially groups of Twitter users. Lists can be either public or private. All Twitter Lists have subscribers and members. Subscribers can see the List's feed of tweets. In a private List, subscribers must be invited to join the group. The List's feed of tweets consists of tweets posted by members of the List. Anyone can add a user that they follow as a member of a List. Users are not able to tell if they are members of a private List unless they are invited to subscribe to the List. Articles that are spread via Lists are often referenced in Twitter conversations using the #EduColor hashtag. Occasionally, off-peak conversations attract trolls, people who intentionally try to provoke arguments by making negative polemic statements. Additionally, and as is explained in greater detail in a following section, the synchronous aspect of Twitter chats increases the hashtag's visibility. This has contributed to recent instances of white, ostensibly "woke" educators

(who are conscious of social injustices) who are co-opting the hashtag #EduColor because they recently decided to try to adopt a culturally sustaining pedagogy, as they view it as the next, new, and ultimately passing, trend. In doing so, those who are new to the scene are ignoring the efforts of those who have been doing this type of work for years while promoting their own work – which among other things ostensibly calls for amplifying the voices of teachers of color – and arguing for its importance and relevance without acknowledging the work that has already been done and is currently being done by teachers of color and allies.

Participants

In general, participants in both #SaturdaySchool and #EduColor include educators (K-12 classroom teachers, teacher-educators, other educators who teach in higher-education), college students (undergraduate and graduate students), activists, artists, scholars, musicians, and poets. I interviewed a total of six participants. Three of the people interviewed for this study have participated in #SaturdaySchool (Laura, Alicia, and Ed); two of the people interviewed for this study have participated in #EduColor (Carolina and Olivia); one person interviewed for this study has participated in both #SaturdaySchool and #EduColor (Georgia).

#SaturdaySchool

In the early days of #SaturdaySchool, participants included college students and those who taught at the higher-education level. Currently, #SaturdaySchool consists of scholars, activists, musicians, poets, and artists. It has been used on occasion in higher education course work (undergraduate and graduate level History and Social Work courses). It seems as though when this happens, expectations for student participation are

minimal. Students are encouraged to participate, but not required to do so. Some students post tweets, comment, and/or ask questions; others seem to merely "like" and/or "retweet" posts.

Laura. Laura created #SaturdaySchool and hosts it. She currently resides in a large city on the U.S. Gulf Coast. Laura does not have a hometown as she was born on a military base and has moved approximately 50 times in her life. Laura has a Bachelor of Science in History and Government; two master's degrees, with a Master of Science in History and a second master's degree in Southern History; and a Ph.D. in Southern History and Sociology. She has taught early childhood education, elementary education, secondary education, higher education, private education, has worked in the field of educational consultation, and has conducted corporate educational training.

She participates in #SaturdaySchool on a daily basis and has been a part of it since the day it began. She is by far the most prolific user of the hashtag. In addition to #SaturdaySchool teach-ins, she has also participated in Twitter chats but not #EduColor. In addition to Twitter, she uses Facebook, Instagram, Pinterest, and LinkedIn for #SaturdaySchool. She does research to find both scholarly articles and online news sources during preparation. While preparing for and participating in #SaturdaySchool, Laura uses the full range of digital technological communication devices she has at her disposal: a mobile device, a tablet computer, and a laptop computer.

Alicia. Alicia is from a large urban area in a southern U.S. state on the eastern seaboard, and currently lives in the same city as Laura. At the time of her interview, she was a student at Lone Star College, where she first met Laura after enrolling in her History course. She has been participating in #SaturdaySchool two to three times per

month, starting approximately three years prior to our interview. In addition to Twitter, Alicia is active on Instagram. When preparing for #SaturdaySchool, Alicia uses news media sites such as the *New York Times* and *HuffPo*. She tends to use her mobile phone and her tablet computer, but not her laptop computer, when participating in #SaturdaySchool.

Ed. Ed is from a larger coastal city in New England and is currently living about a half hour away in a smaller inland town located in the same state. He is currently pursuing a degree in a field of study related to Computer Science. He began participating in #SaturdaySchool approximately four years prior to our interview. Ed also participates in Twitter chats, but not #EduColor. He participates more than once per week as he is involved in behind-the-scenes work with Laura. In addition to Twitter, Ed is active on Facebook and Pinterest when doing work for #SaturdaySchool. While preparing for and participating in #SaturdaySchool, Ed gathers information from online news sources as well as blogs and uses every digital communication device at his disposal: his desktop computer, his tablet computer, and his mobile device.

Georgia. Georgia is from a mid-sized city in a midwestern state. She holds a Doctorate in Curriculum and Instruction. She currently teaches secondary grade-level science. In the past, she has taught Spanish as well as science at the higher education level. She is deaf and Hispanic. She participates in #SaturdaySchool, two to three times per month, and began approximately one year before our interview. She has also participated in Twitter chats such as #EduColor, #EdChat, and #EdTech for roughly the same amount of time. In addition to Twitter, Georgia is active on Facebook, Instagram, and LinkedIn. When preparing for and participating in teach-ins and Twitter chats, she

looks for resources at online blogs and online news outlets. She uses both her mobile phone and her laptop computer while partaking in teach-ins and Twitter chats.

#EduColor

#EduColor is an "inclusive cooperative of informed, inspired and motivated educators, parents, students, writers and activists who promote and embrace the centrality of substantive intersectional diversity" (EduColor website, n.d., n.p.).

Georgia. As previously mentioned, Georgia has participated in both #SaturdaySchool and #EduColor. During our interview, we discussed matters pertaining to #SaturdaySchool as well as #EduColor.

Carolina. Carolina is from a mid-sized city in the western part of a midwestern state, and currently resides in a smaller suburb of a large city formerly known for industrial manufacturing in the same state. Carolina is currently a Ph.D. student at a Division II public research university near the area in which she currently lives. She has a Bachelor of the Arts in History, Social Studies, and Teaching English to Speakers of Other Languages. She has a Master of the Arts in Teaching and Curriculum. Carolina currently teaches in higher education. At the time of our interview, she was teaching courses in Social Studies methods and teacher education. Carolina has also served as a clinical instructional coach. She previously taught secondary grade-level Social Studies.

Carolina has participated in #EduColor, two to three times a month, for approximately four years. She has participated in other Twitter chats such as #MichEd. She has tweeted the #SaturdaySchool hashtag but does not appear to have participated in a #SaturdaySchool teach-in. When preparing for Twitter chats, she gathers information

from blogs and online news outlets. She uses her mobile phone and/or laptop while participating in Twitter chats.

Olivia. Olivia is currently a librarian at a public secondary school in the large capital city of a U.S. mountain state. She has previously taught Language Arts at the middle school and high school level. Olivia has been participating in #EduColor since the earliest days in late 2014/early 2015. Olivia is an "advocate for all students and public education", her work focuses on "equity, anti-bias/anti-racist education, culturally sustaining pedagogies, and literacy in the digital age" (Bray, 2018, n.p.). In addition to #EduColor, she is also involved, behind the scenes, in Twitter chats that use the hashtags #DisruptTexts and #ClearTheAir.

Research Question 1

This study addressed two research questions. The first research question was:

Q1 What are the shared values/beliefs and behaviors of K-12 classroom teachers who operate as transformative intellectuals in online places?

I intentionally did not define these three terms prior to beginning fieldwork. Carspecken (1996) recommends against entering the field with firmly established definitions for concepts of which a researcher is trying to gain a better understanding. Entering the field with conceptual definitions can potentially distort power dynamics by reducing the agency of the people being studied. A study with a critical ethnographic perspective approaches fieldwork with the intent of avoiding previous practices that have resulted in the exploitation of the people who are being studied. I also wanted to avoid establishing conceptual definitions prior to entering the field in order to be open to the possibility that participants of either #SaturdaySchool and/or #EduColor had their own group-specific definitions of the terms in question. However, I did not encounter any evidence to suggest

that either groups' understandings of the terms that were noticeably different from the commonly accepted definitions. As a result, I established definitions and distinctions between the concepts during data analysis. I decided to use the is-ought distinction to differentiate between the way participants thought things *ought* to be as opposed to the way in which participants thought things *actually* are.

Values and beliefs

For the purpose of this study, "values" are defined as having a sociocultural and historical dimension, address "desirable goals or modes of conduct that will lead to the attainment of these goals", are hierarchical, ask "what is the good life?", and are the basis of behavior and motivation (Fischer, 2018, n.p). For the purpose of this study, "beliefs" are defined as being specific; they can be individual and/or collective and are historically developed through cultural practices. are what a person holds to be true or false, and/or right or wrong; and they result from judgements based on experiences (Coleman, 2018, n.p.).

#SaturdaySchool values and beliefs.

Topic domain 2: knowledge. A fundamental tenet of #SaturdaySchool is the understanding that there is inherent value in having a venue for "people's education" in which "public teaching" can take place. Another underlying tenet of #SaturdaySchool is the notion that social movements ought to use art, poetry, and music to foster group identity and group consensus. Laura explained that "the value of art as a tool for social justice, it's extremely important and valuable in things like group identity and group consciousness."

Additionally, participants feel as though there ought to be a forum in which to discuss social-justice and human-rights topics that are not discussed often and/or are controversial, unfamiliar, and related to anti-oppression. When Ed started participating in #SaturdaySchool, he was "used to people kind of dismissing questions" similar to the ones that arise in #SaturdaySchool conversations and "acting like [these types of] questions weren't valid or acceptable." Alicia was initially drawn to #SaturdaySchool because of the nature of the topics. She explained:

> The topics were things that I really didn't know about, and it kind of helped open my eyes to things that are occurring around me. It was like: "Wow! No one's ever really talked about these things. I've never been, you know, educated on this."

Georgia noted the controversial nature of some of the weekly topics of discussion as a reason that she initially became interested in #SaturdaySchool. Georgia recalled one weekly topic pertaining to sex workers. At first, she was "on one end of the spectrum" and did not approve of the profession. However, she reported discussing the topic with Laura, then reading pertinent academic literature on the subject, which "transformed [her] perspective" on the issue. Participants also place importance in archiving the resources shared at weekly chats, making them publicly available in a repository, and promoting the repository; even if it is only accessed by one person.

Participants view #SaturdaySchool as a network of teachers and teachers of color that has ease of access for teachers with some disabilities, such as hearing difficulty as well as teachers with some forms of social anxiety. Additionally, #SaturdaySchool is perceived to be a repository of knowledge and a place to encounter people with different perspectives, as well as topics and issues that impact participants on a daily basis. As

Alicia explained: “It’s not just a topic, it’s something that impacts us every day.” Georgia reported that she likes participating in #SaturdaySchool “because it puts me in touch with other teachers when we talk about racism”. In addition to topics, she also said: “I’ve made so many connections through” communities like #SaturdaySchool and #EduColor “that just really helped me grow” as a teacher. They operate based on the understanding that #SaturdaySchool can be viewed as an extension of higher education, a place to conduct research for higher education, and a place for classroom teachers to partake in professional development. Ed recalled: “When I have an assignment, I go straight to the Pinterest board and pull up some of these articles and just start plugging away at my paper.” Participants explained that #SaturdaySchool is a place that bridges the gap between policy experts and activists.

Topic domain 4: opinions/values. #SaturdaySchool’s asynchronous format is attributable, at least in part, to Laura’s pedagogical view that people who want to learn and are present should be welcomed into the learning environment, regardless of whether or not they arrived at a seemingly arbitrarily determined “start time”. Participants have frequently posted tweets containing variations of the expression: “You’re never late for #SaturdaySchool!”, almost always with a positive connotation, often seemingly to function as a way to promote #SaturdaySchool. Ed explained:

> Lately, I find myself kind of participating in #SaturdaySchool the way Laura has always talked about it; the way she says: “No one is ever late to #SaturdaySchool!” A lot of times, I’ll do it like when I was working, and I’d be on my lunch break.

Use of the term “never late” and/or variations of it also appears, at least in part, to be a means by which people who are familiar with the details of how #SaturdaySchool works are able to indirectly signal their familiarity and imply an ability and willingness to offer advice to newcomers, while also showing newcomers that they are welcome any day of the week.

Participants also think of #SaturdaySchool as a network of people that belongs to everyone; they operate based on the understanding that people should be able to access such a space; and they think it is important that educators are exposed to the perspectives of artists, musicians, poets, and activists. Laura shared that her goal is “to try to connect artists, activists, and scholars” and explained that she views it as a

> triumvirate of these three kinds of forces that can bring convoluted, overly descriptive academic works into a palatable form that people can use on the mass level, and then activists can use it to inform themselves and to help distribute the information.

Additionally, participants reported that more professors, teachers, and educators in general should use Twitter to include a greater amount of differing perspectives as well as to facilitate debate and discussion outside of normally scheduled class hours. They also stated that people should have the tact to be able to challenge other peoples’ views without being confrontational, they view it as something that does not happen as often as it should, and they view #SaturdaySchool as a venue where it does occur. While some #SaturdaySchool participants have taken part in Twitter chats that typically have a duration of 60 to 90 minutes, they explained that it should take people a longer amount of time than that to discuss issues pertaining to social justice and human rights. It is worth

noting (and is explained below in greater detail) that those who participate in #EduColor also reported that they operated based on the understanding that it takes longer than 60 to 90 minutes to discuss these types of issues.

Topic domain 5: feelings. Participants reported that they feel that #SaturdaySchool's asynchronous format is a strength as it facilitates ongoing reflective conversations and that it is a source of inspiration that can mitigate some forms of social anxiety. Alicia told me: "It's very educational. It's very motivational. There's some Saturdays where, you know, I'm just kind of feeling down and I start reading [Tweets containing] the hashtag. It kind of motivates me to [feel] like what I do matters."

They also view it as a place to agree to disagree because of mutual respect, a place for teachers who want to do social justice work but fear retribution from unsupportive school administrators, and a place to feel vulnerable, perhaps in part because of the understanding that Laura is not trying to be "#EduFamous" – a term derisively applied to teachers who use social media as a platform with which they attempt to achieve celebrity. Georgia said:

> The thing that keeps me coming back to #SaturdaySchool is that Laura is not in it to be #EduFamous. I want the group to be about the people, for the people, to empower the people, to enlighten. With #SaturdaySchool, there's no one trying to get famous. People are sharing information really for the sake of sharing information and empowering people.

Additionally, participants hope that participating in #SaturdaySchool is something that will help prepare teachers to confront racism in schools.

#EduColor values and beliefs.

Topic domain 2: knowledge. #EduColor participants operate based on the understanding that online social movements, such as #EduColor, ought to be involved with local communities. After she founded #EduColor, Carolina explained: "I felt like [#EduColor] was this home where I could talk about" topics such as the Flint water crisis in Michigan, and connect with other activists and educators doing work in that region. Additionally, participants reported that there ought to be a place, like #EduColor, where teachers of color and allies can network and have conversations. Shortly after joining Twitter and being invited to participate in #EduColor by one of its founders, Olivia began "networking and making connections with various people and trying to participate in regular #EduColor chats".

Topic domain 2: knowledge. Participants view #EduColor as a place that puts teachers in contact with other teachers of color, teachers with disabilities, and teachers who are social justice allies. Carolina described #EduColor as "a chat where I can get involved with specific social justice issues like the Flint water crisis and be an ally and co-liberator with other teachers." It is a home to talk with other like-minded teachers, and a place where teachers can consult a "go-to person" as a source of specific types of knowledge and advice. Carolina explained:

> In addition to #EduColor chats, I will throw out a question to someone, or if someone is asking a question using the #EduColor hashtag, I'll jump in and talk through that. Recently, another teacher-educator was talking about a student struggling through the term "student of color" so she was just asking in the Twitter world and asking: "What are resources to talk about that?" So I talked

> with her and she's also someone I met through #EduColor, so I feel like that happens a lot to me now, I know there's a specific person that I can go to for advice or folks that I could tag in a question or an idea.

Participants also reported that they view #EduColor as an extension of teacher education, and a form of continuing education/professional development for classroom teachers. It is also a venue for teacher educators and preservice educators to connect. #EduColor is understood to be a positive, non-combative, earnest, and sincere environment where people are seldom snarky or ironic. Additionally, participants reported that the hashtag #EduColor is used for networking, connections, and conversations, both synchronously and asynchronously. Participants view #EduColor as a place for discussing topics that pertain to the interest of the group.

Topic domain 4: opinions/values. #EduColor participants reported that topics of monthly chats should pertain to interests of the #EduColor movement and, therefore, the interests of students of color, teachers of color, and people from marginalized social groups. Olivia explained that "generally, chats have a theme and it'll be something that pertains to the interest of the group". #EduColor participants also view participation in #EduColor as something preservice teachers should be encouraged, but not necessarily required, to do. Carolina introduces Twitter chats to teacher candidates within the context of professional learning networks.

> I'll have [my students] pick a chat of their interest. I encourage them to create a Twitter account, but I don't require it. I encourage them to participate in the chat, but I tell them it's okay to just watch it as well, and then after they participate – or whatever they decide to do, I have them email me a reflection.

Topic domain 5: feelings. Participants felt that #EduColor is a source of encouragement and inspiration due to the presence of other like-minded people. Carolina described it feeling "like it was this home where I could talk". Participants feel that the synchronous format is a strength; Georgia felt it is "powerful within that hour"; or as Olivia put it, "its beauty lies in its immediacy", because it facilitates friendships and serves as a catalyst for future conversations that last for "days, weeks, months, or even years." Participants also reported feeling that participation in Twitter chats helps to maintain the momentum of the movement.

My post-interview observations of #EduColor. During our interview, Olivia informed me that some of my initial findings pertaining to values within the #EduColor collective were incomplete. She suggested that I read the articles on the #EduColor website, specifically those written by founders of the collective. I followed Olivia's advice. It is worth noting that #SaturdaySchool does not have a website, nor did any participants from #SaturdaySchool suggest that I read additional background information about their community. For this reason, I conducted additional post-interview data collection for #EduColor. However, I did not collect comparable data for #SaturdaySchool.

My interpretations of #EduColor values and beliefs. #EduColor places value in "protecting public education for all people", in part by "removing its legacy of oppression, exclusion and disenfranchisement" (EduColor website, n.d., n.p.). Additionally, it operates based on the understanding that people should endeavor: to create "long-term leadership opportunities for people of color at all levels of the education system"; to restructure "pedagogies through critical cultural lenses"; and to

address “systemic inequalities of race, gender, ability, sexual orientation, class, occupation, age, religious belief, language and power” (EduColor website, n.d., n.p.).

While conducting post-interview data collection to gain a better understanding of values within the #EduColor collective, I also gleaned insightful information about beliefs within #EduColor. #EduColor is a place to build consensus about problems in education and solutions to the problems. Additionally, #EduColor operates based on the understanding that “all of us have been socialized in oppressive ways, and thus need to embark upon an ongoing process of learning to address our own privilege” as “a necessary first step toward dismantling” social injustices (EduColor website, n.d., n.p.).

Values and beliefs shared by #SaturdaySchool and #EduColor.

Topic domain 2: knowledge. Participants from both communities place value in having an online place where educators and activists can engage in meaningful conversation about social-justice and human-rights issues. These online communities are viewed as sources of reliable information and knowledgeable people.

Participants view both #SaturdaySchool and #EduColor as a place: to challenge what they have learned in the past; to connect with other teachers that help them grow, develop ideas, share professional experiences, and partake in self-critique; and where they find more resources and information than they are able to share. Georgia provided a particular instance of the beliefs that are shared by both groups.

> #EduColor, especially, goes in conjunction with #SaturdaySchool because some of the topics kind of overlap. I thought I was the only Hispanic teacher that experienced what I have experienced in a school with a predominately white faculty. After we talked about racism with #SaturdaySchool, I was better

> equipped. Instead of coming from a place of hostility and anger, you're able to leave your frustrations and transform them into something more productive, a deeper knowledge, a better approach, more sensible, [and] level-headed instead of anger, because nobody gets anything done when you come at everybody angry. They don't listen to that. So I was able to contribute to the conversation about racism at #EduColor, because I had that prior knowledge from learning to calm down.

Topic domain 4: opinions/values. Participants from both groups place value in ongoing and reflective conversations, regardless of whether the conversations began synchronously or asynchronously. Based on their actions, participants also seem to place value in the practice of teachers seeking to learn outside of traditional academic environments.

Topic domain 5: feelings. Participants from both #SaturdaySchool and #EduColor feel as though they walk away a better person after participating in a teach-in or Twitter chat. Both are places to be vulnerable, as well as places of encouragement that provide the support of other like-minded, welcoming people/teachers, and places that belong to everyone. Findings for research question 1 are also presented in Table 4.

Table 4 provides a summary of my findings for research question 1. The table includes an enumeration of key findings of the values/beliefs and behaviors that are shared by participants in #SaturdaySchool. Additionally, it includes values/beliefs and behaviors that are shared by participants in #EduColor. Lastly, it provides the values/beliefs and behaviors shared across both groups.

Behaviors

#SaturdaySchool behaviors.

Topic domain 1: experience/behavior. #SaturdaySchool operates from a public professor/people's education approach in which a person is never late and the conversation never ends. Additionally, Laura told me that she operates based on the understanding that simply because some participants refrain from posting anything in the conversation, it does not necessarily guarantee a lack of participation. Laura informed me that "some people tell me they come to #SaturdaySchool every week" but they

> never respond to a tweet. In my physical classrooms, I don't have trouble with that because I can make eye contact with people and engage people with my body language. But it's just something to get used to in this setting [online places], sometimes people aren't going to talk, [but] it doesn't mean they're not participating.

In other words, it is entirely possible for some people to participate in #SaturdaySchool and learn from the experience, without necessarily contributing to the conversation.

Behind-the-scenes preparation is done with other social media platforms such as Facebook and Pinterest, as it is promoted on Facebook and archived on Pinterest. Therefore, #SaturdaySchool can serve as a gateway to usage of other social media platforms. Facebook event pages are used to prepare and track past and future topics. Twitter, Facebook, and Pinterest also serve as venues to develop new topics. No formal procedure for suggesting new topics exists. Laura tries to model this by discussing and brainstorming new topics via tweets that are publicly available, instead of using direct messages which are private. For instance, one morning in the spring of 2018, I was

making copies in the staff lounge at my school, thinking about a recent weekly #SaturdaySchool topic about transportation, and wondered if #SaturdaySchool had ever had a topic related to travel. I asked Laura about it, and approximately four months later #SoJustTravel was a weekly hashtag. See *Figure 4*.

Sometimes when #SaturdaySchool has a co-host, they are not always reliable. Regardless, when there is a co-host, it increases the likelihood of a more formal question-and-answer format and is more likely to be scheduled for a specific time. For participants, the amount of preparation involved relates partly to whether they have prior knowledge on the topic. Preparatory research is usually conducted the night before the teach-in, and because of the teach-ins' asynchronous format, research is sometimes conducted on Saturday after the teach-in has begun. The amount of preparation involved is also based on the participant's individual interest and value placed in the topic. Alicia cited the weekly teach-in about poetry, #WhyPoetryMatters, now also known as #SoJustPoetry, and said: "there's certain poets that I look to, so you know, I would research all their poems and kind of pick out the ones that go with it, with the hashtag, with the topic."

As Georgia explained, during the #SaturdaySchool teach-in, participants will present pertinent knowledge and utilize information gleaned in other teach-ins and Twitter chats, suggesting that Twitter teach-ins and Twitter chats can be intricately interrelated. People partake in #SaturdaySchool in myriad ways, based in part on the amount of time that they have to dedicate to the teach-in. If they have more time, participants tend to use a laptop computer at home. If they have less time and/or a prior commitment, participants will use a mobile device or a tablet computer at places such as little-league tournaments, grocery store checkout lanes, and/or wedding receptions.

Figure 7. Example of a Way that New Weekly #SaturdaySchool Topics are Generated.

Topic domain 3: sensory. #SaturdaySchool is a place with greater ease of access for participants with hearing loss. #SaturdaySchool's asynchronous format means that it is less likely to trend on Twitter, and therefore less likely to be visible to those who are unaware of #SaturdaySchool's existence. A synchronous question-and-answer format is "not really the nature of an interactive environment" such as #SaturdaySchool. As Laura described it: people "ask questions that are not being pre-determined and well-vetted. We need questions that are a little more controversial, a little more difficult to answer. Those are usually the most important questions" that are being addressed in #SaturdaySchool. Additionally, participants are likely to participate in a variety of different physical locations. Ed explained:

> I find myself kind of participating on my lunch break, [or] if I'm in line at the grocery store and waiting to be rung up, I'll quickly pull out my phone and pull up an article, even now when I'm in between school work and I need to take a break, I'll just pull up [Twitter] and pull up some articles and read them or look for other articles that are related to the topic.

Topic domain 6: classroom impact. Participants reported that #SaturdaySchool has made them more prepared to confront racism in the classroom and more prepared to teach students in urban schools. Additionally, they explained that #SaturdaySchool fosters connections with other teachers, and that these connections allow them to grow as a teacher. In particular, it has also functioned as a gateway to Facebook groups where some teachers connect with other teachers to get advice about how to better serve specific students. When asked if she used online communities to find resources that address specific issues in the classroom, Georgia responded emphatically:

> Yes! I do. I will say that I'm not afraid to say that if there's something that's plaguing me, that's bothering me, I will. There's a child right now. She doesn't like to read, so I asked – this was not on Twitter, it was on Facebook: "What do I do?" There were people who can jump in within the realm of social media who can answer the question: "What do I do about a student who doesn't want to read?" And they jump in with so many examples that were so helpful. They shared stories. [Librarians] said: "Find out, you know, do a kind of book scavenger hunt. Find out what she wants to read."

After having a conversation with her, Georgia found out that her student was currently experiencing some difficulties at home and was temporarily living with her grandfather instead of her mother. Georgia continued:

> I found out that [my student] likes to be on a computer, and found a book called *Crossbones* that allows her to be on the computer. She'd have to read a chapter or two to [find] a website link, [then] she can go on the computer to find out clues [pertaining to the book's plot], and sometimes they have a video. She took a long time to be able to [perform this task on the computer] but I couldn't have done it myself.

#SaturdaySchool also serves as a repository of sources for teachers, college students, and some grade school students to reference after teach-ins. Some K-12 teachers use it as a source of resources for students' research, with some reporting that students' participation and involvement in school appeared to increase after accessing #SaturdaySchool's archives. Ed recalled:

> Laura constantly asks me if we have a [Pinterest] board for something; whether it's a specific topic [or not], it's usually professors asking. [Sometimes it's for] my friends and family's discussions I'm having. Being in college now, when I have an assignment, I go straight to the Pinterest board and pull up some of the articles and just start plugging away at my papers and things of that nature. It's definitely just like a library.

#EduColor behaviors.

Topic domain 1: experience/behavior. #EduColor's synchronous chat format increases likelihood of trending. Therefore, increasing its visibility. This has the potential

to increase explicitly negative attention from trolls and to increase the likelihood of being co-opted by those who view it as the next educational trend and want "someone who looks like them to be running the show" or used by people who are unaware of #EduColor's history and "the work" that many people have been doing for years. Olivia told me a story about something that happened a few weeks prior to our interview:

> I had a conversation not that long ago about people – like the folks at #WokeEd – who aren't really doing things related to #EduColor who are using the #EduColor hashtag because it gives them visibility. They definitely just want to use it to get attention and use the visibility of #EduColor to sort of find the people who #EduColor has found. Everybody these days in the land of Twitter chats – and no shame to the person who does #WokeEd chat – thinks that their idea is the first and that their idea is going to take off, so it becomes really important to acknowledge the people who've been doing the work and not just roll up with a hashtag and try to start something and draw away from people who've already been investing in communities.

#EduColor is a national organization that is organized locally and makes an offline investment in local communities. In other words, it exists at a national level, but it works with local community organizations and activists. #EduColor has a noticeable offline presence, with people often wearing #EduColor clothing at educational events as a way to signal to other #EduColor participants who might also be present. I observed people wearing #EduColor t-shirts at both the 2017 and the 2018 annual conference of the American Educational Research Association.

Participants reported that they found more sources of information than they shared during a chat. After answering a question in a chat, if more time is available, then participants will search for the #EduColor hashtag and respond to other interesting tweets; if they have less time, then they will go to moderator's feed and interact with their posts pertaining to the chat (see Appendix D). Carolina described her routine to me:

> The first thing I did is just like try to respond to the question. Then, if I have a lot of time and I'm not otherwise occupied, then I'll go to the hashtag #EduColor and I just respond to really interesting comments. If I don't have as much time, then I go the person who's moderating – I just go to their [Twitter] feed – and interact with the things that they've posted for the chat.

Some participants reported following #EduColor hashtag, or lurking near the monthly chat by reading tweets that contain the #EduColor hashtag without interacting, before formally participating in the chat. They also report that the question-and-answer format lends itself to side conversations and facilitates Twitter "friendships".

Topic domain 3: sensory. Participants said that #EduColor, and Twitter chats in general, are more accessible to teachers with hearing disabilities. Georgia, for instance, told me:

> I can't hear so I miss a lot of what hearing people say and it's very frustrating because there's a lot of missed opportunities. That's another thing that I like about Twitter is because I can read it and you can actually stop and think before you type anything. Because in normal conversation, people just talk without thinking.

During the chat, participants who are using a laptop or desktop computer reported having multiple web browser tabs open: a tab for notifications, another tab for answering

official questions, an additional tab for side conversations, and a final tab for looking at the moderators' responses to others' answers (see Appendix D). Participants also use mobile phones to live-tweet events pertaining to #EduColor, such as a spoken-word poetry slam performance chronicling the experiences of high school students of color who have been the victims of microaggressions in the classroom.

Topic domain 6: classroom impact. Participants described using #EduColor as a source for finding lesson plans and curricula, for developing ideas and lesson plans with "go-to" people who they are "vibeing with", for sharing educational resources as well as professional experiences, and for engaging in self-critique. Olivia explained to me:

> I find one of the things that's really great is that - #EduColor people are very good at this – it's like if you want to bounce ideas off each other, sometimes I'm just thinking about doing this, or I'm thinking this way, then I'll ask: "Can you help me flesh it out a little bit?" because they're very highly educated in the [#EduColor] collective, so someone's got more knowledge than you do, it can come in handy and then you're accessing the collective brain which is great. It's been really good for me to be able to connect with people who are doing the same work as me. It makes me feel like I'm on the right track. It kind of influences my teaching. It makes me think: "You were right to do this and do it this way." I don't really seek out experts, I just kind of gravitate toward whoever I'm vibing with and whoever seems to really make a lot of sense when it comes down to their response to others, people who are respectful, people who are experienced, and then people who are personal friends.

My observations and #EduColor behaviors. My observations of #EduColor that occurred after I conducted interviews helped to improve my understanding of values and beliefs in the #EduColor collective. However, the same cannot be said for behaviors within #EduColor. I did not encounter any information during post-interview observations that I had not encountered during interviews and/or pre-interview observations.

Behaviors shared by #SaturdaySchool and #EduColor.

Topic domain 1: experience/behavior. Participants from both #SaturdaySchool and #EduColor view teach-ins and Twitter chats as an extension of higher education, and a continuation of teacher education. Both venues offer participants the opportunity to challenge what they have learned in the past. Participants tend to discover the hashtags by either encountering it via another teach-in or Twitter chat, or by being invited to participate by someone else involved in #SaturdaySchool or #EduColor. Research for teach-ins and Twitter chats is typically done the night before and/or the day of the chat, and research tends to relate to prior knowledge. The amount of preparation is related to the amount of interest in topic, and lack of preparation is usually due to lack of time. Additionally, some participants observe and learn without any visible form of involvement. Trolls and trolling is infrequent. Sometimes it is, at least partially, an attempt to co-opt the work being done by those who have been involved for many years.

Topic domain 3: sensory. Participants from both #SaturdaySchool and #EduColor explained that during conversations, people “jump in and ask questions”, and that these conversations can continue for years.

Topic domain 6: classroom impact. Participants from #SaturdaySchool and #EduColor view both places as venues in which teachers can develop ideas and share professional experiences while connecting with other teachers to brainstorm and engage in self-critique. Additionally, both places are referenced for resources that are generated and compiled during teach-ins and Twitter chats. Participants also reported that participation helps to prepare teachers to better educate students in urban schools.

Research Question 2

In my study, the second research question is somewhat of a sub-question to my first research question. As mentioned in Table 3, research question 2 functions as stage four of data collection and analysis. For this study, research question two was:

> Q2 What role do non-human actors play in sustaining the systems or networks that comprise the online places in which teachers operate as transformative intellectuals?

In order to gain a better understanding of the role of non-human actors in sustaining the online places in which teachers operate as transformative intellectuals, I used the viable system model (VSM) to analyze the role of the hashtag #SaturdaySchool, the role of weekly #SaturdaySchool teach-ins, and the roles of hashtag communities such as #SaturdaySchool and #EduColor.

Analysis of #SaturdaySchool

Tier one. When viewing the hashtag #SaturdaySchool as a part of a viable system, it does not have a single tier one system that addresses matters pertaining to implementations or operations. Rather, it has myriad tier one systems. While there are an exceedingly large number of tweets containing the hashtag #SaturdaySchool, the viable system model is based – among other things – on the cybernetic principle that virtually

all systems are smaller subsystems contained within larger and more complex meta-systems. Viable systems utilize procedures that allow for the reduction or attenuation of variety. With that said, I categorized 108 possible variations of a tweet containing the hashtag #SaturdaySchool (see Appendix E.) Each tweet could, arguably, be viewed as a viable system with its' "likes", "retweets", "retweets with comments", and "replies" functioning as various subsystems in a viral tweet that acts as a meme in the classical sense, a cultural transmission that is a self-replicating living structure (Dawkins, 1989). A viral meme could be framed as a viable system.

Tier two. As previously mentioned, the purpose of tier two is to prevent conflicts from arising between tier one systems. As is the case with tier one systems, a viable system could potentially have multiple tier two system. In the instance of general use of the #SaturdaySchool hashtag, a user's Twitter feed has multiple features that prevent conflicts from arising. When a person searches for tweets containing a particular hashtag – such as #SaturdaySchool or #EduColor, tweets are placed into a linear, chronological order so that tweets made at the same time do not appear as palimpsest texts superimposed over one another. Additionally, Twitter has a feature that has been available on its mobile app since at least 2018, and is also an option at the website. It allows users to temporarily see tweets made by the users whom they follow in chronological order instead of the default view in which Twitter's algorithms determine the particular tweets and the order in which they appear in a user's Twitter feed. Having multiple systems that can perform the same function, or redundancy, is also an aspect of a viable system. For example, able-bodied humans can balance with visual stimuli and with inner-ear auditory stimuli.

Table 4

Values and Beliefs & Behaviors Shared Across and Within Both Communities

	VALUES and BELIEFS	**BEHAVIORS**
Shared within #SaturdaySchool	Social movements ought to include views of artists, poets, and musicians; Ought to be a forum to discuss controversial, anti-oppression related topics; Should not be defined start and end times for social-justice and human-rights discussions; Repository of knowledge; Impact participants and similar people on a daily basis; Participation can mitigate some forms of social anxiety; Place that facilitates ongoing, reflective conversations; Place for classroom teachers to partake in professional development;	"Never late" for #SaturdaySchool; Other social media platforms used for behind-the-scenes prep; Connects teachers with other teachers who are experienced/knowledgeable to help teachers address issues with specific students;
Shared within #EduColor	National movements ought to have ties to local communities and issues; Teachers of color and allies ought to have a network to do anti-oppression social-justice work; Monthly chats' topics ought to pertain to students and teachers of color; Place to get involved with/informed about local issues; Place for networking and conversations that are both synchronous and asynchronous; Source of encouragement and inspiration for participants; Monthly Twitter chats as means by which to further the movement;	Participants use multiple tabs during monthly Twitter chats; Chats' synchronous format facilitates side conversations that can last for years and Twitter "friendships"; Good source of knowledgeable, "go to" people; #EduColor hashtag occasionally used to live tweet events;

Table 4, continued

	VALUES and BELIEFS	BEHAVIORS
Shared across both communities: #SaturdaySchool and #EduColor	Ought to be online communities for teachers and activists; Ought to be communities that function as sources of reliable information and knowledgeable people; Monthly chats' topics ought to pertain to students and teachers of color; Places to challenge what was learned in the past, develop ideas, share professional experiences, and engage in self-critique; Participants report that they walk away feeling better; Places to feel vulnerable and provide/receive support;	Participation in online communities as an extension of higher education/venue for teacher professional development; Time spent on preparation and participation related to interest Participants join in before learning details of community; Venue to develop new ideas and share professional experiences

Tier three. Tier three systems are concerned with the continual monitoring of the environment in order to allow for a wider variety of action. In this instance, monitoring can occur via Twitter's list of "trending" hashtags as well as hashtags displayed more prominently in a particular user's feed that has resulted from an increased use of hashtag in tweets by those accounts that an individual follows.

Tier three star. As previously mentioned, tier three star is not a full-fledged independent system. This stage is sometimes written as "tier three*". There is no special meaning behind the use of the word star in the term. It functions as a way to include another step into a numbered sequence. When Stafford Beer first developed the VSM, tier three star was more of a component of tier three systems. Later work in second-order cybernetic thought, which provides the framework that forms the basis of the viable

system model, led to the inclusion of tier three star in the viable system model. Tier three star is a means of "measuring instruments that measure deviation of norms" in tier three systems (Yolles & Fink, 2011, p. 85). Arguably a means to check for validity in this instance, ongoing usage of the hashtag #SaturdaySchool and constant influx of new participants as well as the continual engagement of long-term participants functions as a tier three star system.

Tier four. Tier four systems are concerned with future planning and responding to unforeseen outside events. In the case of #SaturdaySchool, current events occurring in the offline and online world influence #SaturdaySchool's weekly teach-in topics. #SaturdaySchool is able to adapt and respond to events in real time due to Twitter's ability to facilitate synchronous communication.

Homeostasis. In the case of the #SaturdaySchool hashtag, the weekly #SoJustHashtags attenuate variety as they are used to maintain equilibrium by helping to categorize topics of discussion, and by allowing resources to be separated into smaller, more manageable archives.

Analysis of Weekly #Saturday School Teach-ins

Tier one. In this instance, each weekly #SaturdaySchool teach-in can be viewed as a tier one system.

Tier two. For the purpose of weekly #SaturdaySchool teach-ins, coordination is achieved via planning done with Google Sheets, Facebook event pages, Pinterest boards, and tweets that promote and announce weekly #SaturdaySchool topics.

Tier three. Tweets containing the hashtag #SaturdaySchool, regardless of whether they are posted during a teach-in or not, perform tier three functions as they

maintain the momentum of a movement. It is a means by which to measure the level of engagement with weekly teach-ins.

Tier three star. The continued occurrence of #SaturdaySchool's weekly teach-ins with both continued involvement of long-term participants and constant influx of new participants functions as a tier three star system.

Tier four. Future planning for weekly teach-ins and responding to unforeseen external events is facilitated with various other social media platforms that are used for planning, promoting, and archiving weekly #SaturdaySchool teach-ins and shared resources. Planning, promoting, and archiving are activities that function as tier four systems. Using previous weeks' #SoJustHashtags to address current events that occur before they can be specifically addressed by a dedicated weekly teach-in is another mechanism that operates as a tier four system. Allowing people to participate in the teach-in at any point in time and re-examining practices, such as the policy of blocking trolls, are also activities that function as tier four systems.

Homeostat. Homeostasis is achieved and maintained via Twitter based discussions during the weekly teach-in, as well as discussions that occur outside of peak-hours of the teach-in, both provide the opportunity for suggestions and/or requests for new weekly topics. Making connections to previous weeks' topics/#SoJustHashtags in a current week's teach-in is also an aspect that facilitates homeostasis (see Figure 1).

Analysis of #SaturdaySchool and #EduColor Communities

In the previous two sections, I was unable to analyze #EduColor because I was not able to speak with anyone in #EduColor who determines monthly chat topics and/or discussion questions. Therefore, I was not capable of completing analysis beyond tier

three. For instance, I was able to determine that #EduColor is capable of interacting with the world at large, yet I was not able to gain any insight into how those decisions are made. However, in this section, I am looking at Twitter chats and teach-ins as tier one systems. Therefore, I am not concerned with their inner working. Rather, I am looking at them as components of larger systems.

Tier one. In this instance, multiple tier one systems are extant, including education-related teach-ins and Twitter chats pertaining to social justice and/or human rights issues such #SaturdaySchool and #EduColor as well as #ClearTheAir and #DisruptTexts. Other tier one systems include education related chats such as #EdChat, #EdTech, and the #MichEd chat.

Tier two. Google Sheets and other similar open-source, web-based collaborative spreadsheets which maintain a global list of education related Twitter chats and teach-ins, such as the document mentioned by Carolina, perform tier two functions. Third-party applications such as HootSuite and TweetDeck used during Twitter chats function as tier two systems. Similar is the practice of using multiple web-browser tabs for coordination during Twitter chats.

Tier three. Hashtags that appear in Twitter Lists and/or are "trending" function as tier three systems. Similarly, hashtags that appear more frequently in a users' Twitter feed function as a tier three system.

Tier tree star. In this instance, continued involvements of long-term participants and the constant influx of new participants are features that operate as tier three star systems.

Tier four. Policies such as the desire to supplement higher-education, teacher-education, and in-service professional development as well as teachers' desires to improve their ability to teach a culturally sustaining, anti-oppression pedagogy; to teach students of color; and to teach in urban schools are aspects of teach-ins and Twitter chats that function as tier four systems in this instance.

Homeostat. Homeostasis is achieved via higher education teachers who suggest or recommend participation in Twitter chats and teach-ins ins, as well as research that spreads the word about Twitter chats and teach-ins and seeks to increase the visibility of the practice within academia.

Conclusions

My findings suggest that the non-living actors that I analyzed are not viable systems on their own. However, they possess at least a modicum of agency. The non-living actors and online places that I have examined are part of larger cybernetic ecosystems in which living entities (i.e. humans) play integral roles. In this ecosystem, human and non-human actors have a symbiotic relationship. In order for the ecosystem to be viewed as a viable system, it is necessary to look at the roles of both human and non-human actors.

Summary

The purpose of my study was to gain a better understanding of the shared values/beliefs and behaviors of teachers who operate as transformative intellectuals in online places. My study also sought to gain a better understanding of the ways in which non-human entities influence the ecosystems that sustain the online places in which teachers operate as transformative intellectuals. In this chapter, I presented an explanation

of the online communities in which my participants operate, #SaturdaySchool and #EduColor, as well as a description of the participants in my study. This chapter also provided findings for both of my research question.

Findings were categorized based on the topic domains of interview questions. Findings for research question 1 pertaining to values and beliefs suggested that participants in both communities think that teachers should have access to and participate in online places in which teachers, teacher-educators, and activists engage in social-justice and human-rights work. My findings demonstrated that participants thought it was important to have a venue for ongoing and reflective conversations. Additionally, my findings suggest that participants in both groups view their communities as places to challenge what they have learned in the past, to connect with other teachers, and share professional experiences. Participants also view both communities as sources of encouragement and places to feel vulnerable.

My study identified behaviors shared within each community and the behaviors shared across both communities. Findings pertaining to behaviors suggest that participants in both #SaturdaySchool and #EduColor view teacher Twitter chats and teach-ins as an extension of higher education and a form of professional development for in-service teachers. Participants from both communities also report that sometimes new participants begin interacting during teach-ins and Twitter chats without first gaining a complete understanding of the way that the community operates, and that this low barrier of entry was a strength of their community. Participants in both communities use #SaturdaySchool and #EduColor as arenas to develop ideas, share professional experiences, and engage in self-critique.

My second research question sought to gain a better understanding of the roles played by non-human entities in the systems that sustain the online places in which teachers operate as transformative intellectuals. My findings identified three non-human actors in the cybernetic ecosystems that sustain online places. I analyzed the role played by the hashtag #SaturdaySchool and the various weekly #SoJustHashtags. Then, I analyzed the role played by a weekly #SaturdaySchool teach-in. Lastly, I analyzed the role played by the hashtag communities #SaturdaySchool and #EduColor. Individually, hashtags, weekly teach-ins, and/or hashtag communities can be viewed, on their own, as viable systems. Additionally, a hashtag can be viewed as a sub-system within a weekly teach-in which itself is a larger system. Furthermore, a hashtag and a weekly-teach-in can both be viewed as sub-systems within a hashtag community, which can be viewed as a larger system.

My findings for research question two were framed from the perspective of a hashtag as a viable system, a weekly Twitter teach-in as a viable system, and hashtag communities such as #SaturdaySchool and #EduColor as viable systems. My research found that the aforementioned types of systems had aspects that functioned to coordinate the delivery and display of visual information, as well as to coordinate behind-the-scenes planning for the future, and alert users about hashtags that are currently being used relatively more frequently than others. This chapter ends with a brief conclusion of my findings for both of my study's research questions.

CHAPTER V

DISCUSSION

The purpose of this study was to gain a better understanding of teachers who operate as transformative intellectuals in online places as well as a better understanding of the non-human entities that sustain the online places in which teachers operate as transformative intellectuals. Research question 1 asked: What are the shared values/beliefs and behaviors of K-12 classroom teachers who operate as transformative intellectuals in online places? Findings for research question 1 were separated into two categories: values/beliefs and behaviors. Findings were also categorized based on topic domains that informed my interview questions. I described values/beliefs and behaviors that were shared within #SaturdaySchool, as well as the values behaviors and beliefs shared within #EduColor, and the values/beliefs and behaviors shared across both groups. Research question 2 examined the roles of non-human entities within the cybernetic ecosystems that sustain the online places in which teachers operate as transformative intellectuals. I used the viable system model to analyze a hashtag as a viable system, a weekly Twitter chat as a viable system, and hashtag communities as viable systems. This chapter provides analysis of my findings pertaining to values/beliefs and behaviors as well as my findings pertaining to the roles of non-human entities on online places in relation to findings from similar research studies. This chapter concludes with a brief explanation of the limitations of this study and the possibilities for future research.

Research Question 1

The purpose of my research in this study was to gain a better understanding of online communities in which teachers operate as transformative intellectuals. My first research question asked: What are the shared values/beliefs and behaviors of K-12 classroom teachers who operate as transformative intellectuals in online places? A summary of my findings were shown in Table 4.

Values and Beliefs

My first research question sought to describe the shared values and beliefs as well as the behaviors held by members across the hashtag communities #SaturdaySchool and #EduColor, in addition to the values and beliefs as well as the behaviors held within each individual community. Findings for values and beliefs shared by both communities indicated that participants think it is important for educators and activists to have online venues in which they can engage in reflective, ongoing conversations that can be carried out synchronously or asynchronously. They also view these online places as sources of reliable information and knowledgeable people. Participants also believe it is important for teachers to learn outside of traditional academic environments. Participants from both #SaturdaySchool and #EduColor view their respective communities as places to share, grow, and develop ideas. Both communities are viewed as places to be vulnerable and places to receive encouragement.

#SaturdaySchool values and beliefs. The #SaturdaySchool hashtag community operates based on the idea that it is important for social movements and social-justice oriented educators to use art, poetry, and music to inform their approach to activism and teaching in the classroom. Participants reported that they thought it was important to have

discussions about controversial human-rights and social-justice issues, such as the topic of sex workers. Participants within the #SaturdaySchool hashtag community thought that the weekly chats' asynchronous format was a strength as it allows people to contribute to the conversation at any time and on any day, sometimes after conducting additional research in response to comments and resources shared earlier in the conversation. #SaturdaySchool participants felt that participation in monthly Twitter chats could be used to facilitate increased discussion in higher-education course work.

#SaturdaySchool is viewed as a place with ease of access for participants with lack of hearing. Topics are viewed as addressing issues that impact participants on a daily basis. Participants believe that the information shared in #SaturdaySchool is empowering and that the community is based on mutual respect. They also believe that participation will better prepare them to confront racism in schools.

#EduColor values and beliefs. Participants in #EduColor reported that they thought it was important for national movements like #EduColor to be involved in local communities and local issues. Participants also thought it was important for #EduColor's monthly topics to be pertinent to the interests of students of color, teachers of color, and other people from social groups that are marginalized in the United States.

Unlike #SaturdaySchool and #EduColor, in the online blogging communities that Dennen's study (2014) researched, "the burden is on the newcomer to learn about and interact appropriately with the community" (p. 350). While members in the online blogging communities in Dennen's study (2014) are generally academics, the communities are not completely oriented toward teaching. Rather they are spaces for discussions that include elements of both the academic lives and personal lives of

bloggers. Perhaps because the communities that I examined in my study are focused on education, participants seem to place value in providing guidance to newcomers, many of whom jump in and join the conversation before developing an in-depth understanding of how a particular community operates.

In addition to online blogging communities, educational research has explored hashtag communities of teachers on Twitter. Much research has been done about communities that use the hashtag #edchat. Salavuo (2006) identified reasons that members of a community cited for participation in online communities. Participants in Salavuo's study (2006) placed value in communities like theirs where they could get advice and help others, share ideas and resources, and meet new like-minded people. Britt and Paulus (2016) also examined a Twitter based teacher community that uses the hashtag #edchat. Participants in their study reported that they felt teachers ought to be "seeking out places of informal learning" (p. 57) in a manner similar to the participants in my study. However, unlike #EduColor, participants in #edchat did not place value in introducing themselves at the beginning of a chat.

In another study exploring online communities for K-12 teacher professional development, Hur and Hara (2007) stated that their participants thought it was important for teachers to have a community in which the felt a "sense of ownership" (p. 245). However, unlike my study, their participants used the term "autonomy" to describe an aspect of their communities in which they placed value. One of my participants, Georgia, reported that it was important for her to have a place to discuss anti-oppressive teaching as her school's administration was not supportive of her efforts to incorporate it into her classroom. Many of the participants in my study framed #SaturdaySchool and #EduColor

as a component of their learning networks. However, participants in my study did not use the term “autonomy” when describing their communities.

Unlike my study, other studies have found that participants place value in being in an online community with other teachers from their school. Khalid, Joyes, Ellison, and Karim (2013) reported that teachers think that “an informal approach [to] teachers’ professional development” is important (p. 109). However, unlike my study, Khalid et al. (2013) found that teachers felt as though “they learned best through discussions and sharing conversations with other teachers in their own schools” (p. 105). I encountered evidence to the contrary. One of my participants, Georgia, was drawn to #SaturdaySchool and #EduColor because she wanted to have a venue in which she could network with other teachers about incorporating a social justice oriented approach to teaching into her classroom, because her school administrators were unsupportive of her endeavor. In her view, anonymity in online places was a strength that she associated with participation in hashtag communities. Some of my other participants, specifically Olivia and Carolina, placed value in being able to connect with teachers from outside of the places where they taught. They valued the presence of ideas and perspectives that were different from their in-building colleagues.

Participants in #EduColor viewed their community as a source of knowledgeable people and as a place for discussing topics that pertain to issues that are impacting students of color, teachers of color, and other members of marginalized social groups. Participants in #EduColor believe that a strength of their community is the monthly Twitter chats’ synchronous format as it facilitates new friendships and serves as a catalyst for future conversations related to monthly topics.

Visser et al. (2014) conducted a mixed-methods study about teachers using Twitter for professional development. Comparable with my study, the participants in their study reported that "the various types of professional development received via Twitter have direct benefits on teachers' professional knowledge and stature" (p. 407). Also similarly, participants in their study "reported learning about the latest research, pedagogical strategies, and best practices"; that they "discovered web-based resources, lesson plans, and innovative ideas about [content-area] instruction; and…reaped professional benefits" that are "acquired through meaningful, interpersonal relationships within [a] participatory culture" (p. 407).

In Britt and Paulus' (2016) study, participants viewed #edchat as a source of "flows of information" as well as "sustained mutual relationships" which aligns with the findings in my study (p. 54). Also in alignment with my study are some of the findings from Davis (2015) which examined usage of the hashtag #edchat as well; participants reported that they viewed "the #edchat forum as a place to share knowledge and resources", such as "stories, information and best practices" (p. 1554). Participants in Davis' (2015) study also explained that they experienced "a sense of belonging through engagement" and that they thought it was important to have a "source of meaningful development" (pp. 1555-1556).

My findings are generally phrased in positive terms because, for the most part, participants in my study described their experiences in that manner. Unlike my study, Davis (2015) addressed specific drawbacks to participating in a hashtag community. However, this could arguably be a matter of the perspective from which a participant's statement is presented and/or the perspective in which the findings are framed. For

instance, participants from #EduColor described the monthly chat positively, based on the understanding that its synchronous format is a strength. Davis (2015), however, argues that "a "dialogue momentum or urgency may be lost if too much time passes between respondents' online interactions" (p. 1552).

Some studies have examined online communities of teachers that utilize purpose-built platforms as opposed to a social media platform that the public can access. Nevertheless, some of those findings were similar to the findings in my study. In Hur and Hara's (2007) study, participants thought it was important to "have a sense of ownership, and acknowledge values of participation"; to "provide online and offline interaction; and to provide an easy way to use technology systems" (p. 254). Participants in their study, unlike participants in my study, viewed the practice of obtaining more educational resources than they shared in a negative light. This appears to be, at least partially, due to the fact that participants in Hur and Hara's study (2007) were re-using resources without modifying them to suit their individual classrooms. My participants did not report instances of this practice. Additionally, participants in #SaturdaySchool and #EduColor viewed being able to obtain more resources than they were able to share as a collective strength of their respective communities.

Some participants who were studied in other research pertaining to online communities of teachers did not place value in the autonomy of their community. Instead, they preferred to have an active overseer who helped to maintain their community. Tsiotakis and Jimoyiannis (2016) looked at online communities of teachers using purpose built platforms. Participants in their study reported different beliefs than participants in my study. In Tsiotakis and Jimoyiannis' (2016) study, participants explained that

"continuous intervention from the [website] coordinators' side is necessary to promote teachers' active participation in the [online] community activities" and that "a formal schedule and organisation, based on specific course type units with obligatory individual activities and creations, could better promote teachers' engagement and commitment to contribute to the online community" (p. 53).

Unlike my study, Britt and Paulus (2016) found their participants believed it was important to have a "very quick setup of a problem to be discussed" (p. 49), as opposed to #SaturdaySchool and #EduColor which assume that participants have at least some understanding of the topic(s) of discussion(s). However, their study – in a manner similar to mine – found that participants viewed continued conversations and "sustained mutual relationships" facilitated via online communication as a strength of their community.

Comparable to my participants, participants in Visser et al.'s study (2014) "reported perceived benefits were professional development and meaningful relationships that teachers formed with other teachers who use Twitter" (p. 396). Hur and Brush (2009) also explored online communities of teachers. Participants identified reasons for participating such as "sharing emotions, exploring ideas, and experiencing a sense of camaraderie" (pp. 290-291).

Unlike my study, Prinsen, Volman, and Terwel (2007) found that gender stereotypes for participants in online places are extant. I did not encounter evidence to suggestive gender stereotypes. However, in my study I was not actively looking for evidence of it.

Behaviors

In addition to values and beliefs, I also sought to gain a better understanding of the behaviors shared across both communities as well as the behaviors shared within each community. Participants tend to conduct preparatory research for Twitter chats and/or teach-ins the night before the event and/or the day of the event. The amount of preparation and participation is generally attributed to the amount of interest and background knowledge that a participant has in the topic of discussion. Participants attributed a decrease in and/or the lack of preparation and participation to a lack of the requisite amount of time, not to a lack of interest and/or background knowledge. In other words, participants will make time for Twitter chats and teach-ins which they think are valuable. This suggests that teachers are more willing to make time for educational episodes when they can see the significance in doing so. Participants from both #SaturdaySchool and #EduColor use their communities to develop ideas, share professional experiences, engage in self-critique, and seek out reliable sources of information and reliable people for both general reasons and to address issues with specific students in the classroom.

#SaturdaySchool behaviors. #SaturdaySchool participants tend to communicate asynchronously, sometimes conducting research after they have begun to participate in the weekly teach-in's conversation. Compared to their #EduColor counterparts, they tend to participate in a greater variety of physical locations – such as a little-league baseball tournament, the grocery store checkout lane, or while attending a wedding reception. Participants in #SaturdaySchool reported using it to find sources of information that

helped them improve their classroom practices and as a resource toward which they directed students who were conducting research.

#EduColor behavior. Participants in #EduColor tend to interact with each other synchronously during monthly Twitter chats. Participation seems to be more likely to be mediated via a web-browser (as opposed to a mobile phone/tablet computer application) because participants reported having multiple tabs open in their web browsers during a Twitter chat. Each tab serves a purpose. Those tabs function as means by which to delegate to the non-human agents that circulate artifacts through the online and offline networks that comprise the cybernetic ecosystems in which hashtags exist, Twitter chats and teach-ins occur, and hashtag communities such as #SaturdaySchool and #EduColor operate. The same can be said for other entities, such as digital communication devices, the type of data signal being used, and third-party applications like HootSuite and TweetDeck.

A noticeable theme in findings about participation in online communities of teachers is the finding that members participate at different levels; similar to what I found in both #SaturdaySchool and #EduColor (Britt & Paulus, 2016; Kulavuz-Onal, 2013; Tsiotakis & Jimoyiannis, 2016; Wesely, 2013). Kulavuz-Onal (2013) found that participants learned about new online communities after participating in other online communities, which aligns with what some participants in my study reported. In a manner that is similar to #SaturdaySchool but different than #EduColor is the "absence of introductory preambles" (Britt & Paulus, 2016, p. 49). Unlike both communities in my study, Britt and Paulus (2016) found that chats typically began with a "very quick set-up of a problem to be discussed" (p. 55). Both of the communities in my study operate based

on the assumption that there is at least a modicum of familiarity with the topic(s) being discussed.

While some #SaturdaySchool and #EduColor participants report lurking at the periphery of the community before starting to interact with other community members, other participants appear to have remained in the periphery. Participants in other studies have also reported that they lurked at the community's outskirts initially (Britt & Paulus, 2016; Kulavuz-Onal, 2013; Macia & Garcia, 2016). However, some participants seem to remain lurkers, never venturing away from the community's periphery (Baran & Cagiltay, 2010; Hui, 2015; Hur & Brush, 2009; Hur & Hara, 2007; Tsiotakis & Jimoyiannis, 2016; Wesely, 2013).

Other researchers have studied online communities of teachers as sites for critical reflection. Wesely (2103) described online discussions as a forum for deep thought and critical reflection on issues, such as "inequalities in urban schools" (p. 321). In Baran and Cagiltay's (2010) study about online communities of practice (oCoPs), participants reported that "their professional knowledge improved" after taking part in educational episodes in online places (p. 159). Their study also found that participation in oCoPs led to some of the same encounters that participants in my study also reported "gaining different experiences, perspectives, and ideas" (Baran & Cagiltay, 2010, p. 160).

Some research that examined online communities of teachers has looked at communities utilizing platforms that are not accessible by the general public. Conole et al. (2011) explored a purpose-built online platform for teachers called Cloudworks. Participation in Cloudworks is similar to the participation that I observed: synchronous activities and interactions, debates discussing academic literature, aggregating resources,

and consulting experts (Conole, Galley, & Culver, 2011). Unlike my study, Conole et al. (2011) also found that participation included formal elements of learning design, such as how to create purpose build online places. My study, specifically research question two, sought to gain a better understanding of the elements that sustain online places, but my research was not explicitly concerned with understanding *how* to create hashtag communities. As previously mentioned, my participants had negative perceptions of some newer hashtag communities. These perceptions are based on the ways the founders of the newer hashtag communities have acted in the past. It seems to be implied that newcomers are discouraged from trying to start their own hashtag communities. Acceptable behavior that leads to the establishment of new hashtag communities associated with #EduColor is generally initiated by someone who has been involved with #EduColor for years and who has moderated monthly Twitter chats. These newer types of chats tend to have a specific content-area focus and do not appear to be perceived to conflict with #EduColor.

Leonard and Leonard (2016) found that in online places, teacher participation resulted in candid reflections about "their cultural roots, perceptions, and experiences" (p. 30). Nett's study (2008) also looked at participation in online places. Much like in my study, participants in Nett's study (2008) reported that asynchronous communication was more convenient as was the ability to participate at home. Nett's study (2008) was published prior to the widespread proliferation of smart phones with social media apps. Participants in my study also found convenience in the ability to communicate asynchronously and in myriad different physical locations. My participants had access to a wider variety of digital communication devices and platforms than participants in Nett's

study (2008). Nevertheless, participants in my study had positive perceptions of the same aspects of the digital technologies as did participants in Nett's study (2008).

Online communities of teachers and professional development has been addressed via recent educational research. Gamrat et al. (2014) examined online learning and teacher professional development. Gamrat et al. (2014) found that participation in online places improved content knowledge such as pedagogy, objectives, evaluation, assessment, and cross-curricular application. It also improved support by increasing teachers' ability to address student concerns, adaptations, and learning (p. 1142). Gamrat et al. (2014) also addressed technology integration in the classroom as well as teachers' personal goals, which are two themes that I did not encounter during my research. Throughout early stages of data collection in my study, I envisioned teachers using hashtag communities as places to gather educational resources that they used to teach students. However, during my study I encountered evidence to suggest that my understanding was incomplete. I did not consider the possibility of grade-school teachers having students directly access archives of resources compiled by the online communities. Nevertheless, participants told me about multiple instances in which students accessed archives of resources made available by #SaturdaySchool. As my study was concerned with professional online communities, the notion of exploring the personal goals of teachers was not taken into consideration. However, these themes could be explored in future research.

Similar to my study, Wesely (2103) looked at #langchat and #edchat and found that participation improved classroom practice by "creating and revising curriculum" and "contributing to the knowledge base through collaboration and discussion" (pp. 311-313).

Additionally, Davis' (2015) findings pertaining to classroom impact identified improvement to classroom practice because participation provided a venue for "reflective thinking" where participants "reflect upon practices, such as instructional strategies, grading, or assessment (p. 1555).

Research Question 2

While my study's first research question sought to explore the human element of the online places in which hashtag communities exist, the study's second research question examined the agency of non-human entities in online places. Findings for my second research question framed the proliferation of individual hashtags, the regular occurrence of weekly Twitter teach-ins and monthly Twitter chats, and the continued existence of hashtag communities #SaturdaySchool and #EduColor as viable systems with non-human entities that possessed at least a modicum of agency.

Other studies with an ethnographic perspective related to human and non-human interactions are extant. Gorur (2011) used actor-network theory (ANT), for instance, to examine "how human and non-human entities are imbricated into the assembling of scientific facts" (p. 76). Gorur (2011) addressed the concept of variety attenuation; however, it used the term "managing complexity" to describe the concept. Other educational research has studied the circulation of artifacts in online and offline learning places. Leander and Lovvoron (2006) analyzed the circulation of "texts, bodies, and objects" in school and online gaming places using ANT. They "argue that space-time dimensions of…networks have direct relevance to understanding…engagement, agency, and identity" in both school and online places (p. 291). My study also explored the

ramification of space time by looking at the relative merits of synchronous and asynchronous formats of communication.

Educational studies have also examined the roles of non-human entities in relation to circulatory artifacts. Nespor (2002) explored non-human agency by examining artifacts that circulate through networks to gain a better understanding of education reform in Virginia. Other researchers have examined the role of human and non-human entities pertaining within the same system. Bruni, Gherardi, and Parolin (2007) studied knowledge in embedded artifacts. Similar to my study, they identified "delegation to the non-human" via use of remote cardiological consultation (p. 563). In my study, tier two systems – such as Twitter's search features and its ability to display tweets in chronological order, the tier three system of trending hashtags, and the homeostasis enabling feature of the weekly #SoJustHashtags are instances of delegation to non-human entities.

Existing research has explored the roles of non-human entities in Twitter chats by examining delegating to the non-human during this type of educational episode. For instance, Davis (2015) studied "managing flow[s] of information" in weekly Twitter chats using the hashtag #edchat and similarly found that "participants mentioned using third-party software" such as HootSuite and TweetDeck for assistance during Twitter chats (pp. 1554 -1556). In my study, participants reported that the format of a chat played a role in the manner in which knowledge was disseminated. In addition, Britt and Paulus (2016) explored the Twitter chat #edchat. Similar to my study, they found that chats facilitated a "rapid flow of information and [the] propagation of information" (p. 56).

My study explored online communities of teachers as a part of a larger learning-based ecosystem with human and non-human entities. Other researches have conducted similar studies. For example, Kimmons and Veletsianos (2016) examined the use of Twitter by education scholars as a "conference backchannel and social commentary platform" at the annual meeting of the American Educational Research Association (p. 445). Although they do not use VSM for analysis, the findings in Kimmons and Veletsianos (2016) could be described with terminology from VSM. In Kimmons and Veletsianos (2016), students, professors, education scholars, hashtags, and the physical conference location itself function as tier one systems; the backchannel and social commentary features operate as tier two systems; "ongoing" hashtags use that occurred through the course of the conference performed as a tier three system; and the use of "event-based hashtags" can be viewed as a tier four system.

Limitations of Study

The following section addresses a few of the limitation of my study. First, limitations stem from the length of time that this study took to complete. Social media platforms can and do change. Changes in Twitter's features occurred during the course of this study. Second, my study did not take my participants' relative degree of technological acceptance into account, which could impact the extent to which my findings could be used by other teachers. Lastly, my analysis is not incredibly critical of the communities that I explored.

First, this study took a considerable amount of time. From the start of initial observation in summer of 2017 until I had completed analyzing data from interviews in early spring 2019, over 18 months had passed. From the beginning of preliminary

research for my dissertation in fall of 2016 until the completion of writing this study in late spring 2019, over 30 months of time passed. Social media can change rapidly in that amount of time. In addition to minor cosmetic changes in the layout of user profiles, during the course of this study, Twitter doubled the number of characters that a tweet could contain, increasing from 140 characters to 280 characters (Gligoric, Anderson, & West, 2018). Additionally, Twitter implemented the option of posting "threads". Threads are a string of tweets in which a user posts multiple tweets simultaneously. In a thread, each tweet is a reply to the previous tweet. Long before my study began, users were able to reply to their own tweets. However, prior to the implementation of threads, users had to post replies in real time, so other users could have potentially replied before the first user had a chance to reply to their own tweet. Additionally, Facebook no longer prominently displays trending hashtags but continues to allow the use of its built-in search features to look for hashtags being used on Facebook. is possible that changes such as these have impacted the cybernetic ecosystems in which they are contained. However, my study does not take these changes into consideration.

Second, my study does not account for my participants' individual degree of technological acceptance. It is possible that my participants were slightly more tech savvy than other teachers. Varying degrees of familiarity with any type of technology are extant and social media is no exception. Simply because someone uses a platform such as Twitter casually, it does not guarantee that they understand all its features well enough to participate fully in a teach-in or Twitter chat. Similarly, casual usage of Twitter does not necessarily suggest a desire to learn how use its features well enough to participate in a

teach-in or Twitter chat. Therefore, the findings of my study may be less applicable to some groups of teachers than others.

Third, my study is not incredibly critical of the communities that I researched. Unlike other studies (Leonard & Leonard, 2006; Lopes Cardozo, Sawyer, & Talavera Simoni, 2015), I did not look for evidence to suggest the existence of gender stereotypes in my communities nor did I actively seek out evidence of participants' classroom practices that perpetuated the beliefs that they sought to confront and eradicate.

Future Research

Three recommendations for future research stood out to me as I neared the completion of this study. First, future research could produce findings with potentially more relevance if it could be conducted on a quicker timeframe. A possible way to decrease the amount of time needed to conduct research is by reducing the scope of the study. It could be accomplished by focusing on an individual teacher who participates in multiple online communities. In conjunction with a limited scope or on its own, the process could also be streamlined by utilizing participants as researchers and/or by having help from co-researcher(s)/research assistant(s).

In addition, future research could also look for a relationship between teachers who operate in online communities and those who integrate digital technologies into their classroom. The topic in my study could be framed in terms of integrating digital technologies into the classroom by future research which focuses on teacher-educators who recommend/encourage that teacher-candidates participate in online communities such as #SaturdaySchool and #EduColor as well as K-12 teachers who direct their students to online communities as sources of information for student research.

Finally, future research could also narrow the scope of intellectual frameworks in this study and – perhaps – make a contribution to the field of ecojustice by using post-humanism, actor-network theory, and the viable-system model to decenter anthropocentrism by examining the agency of non-human entities in cybernetic ecosystems.

Summary

This chapter provided a summary of my study's findings. Additionally, this chapter compared and contrasted the findings of my study with the findings of similar educational studies. First, I described my findings pertaining to the values and beliefs shared across both communities, the values and beliefs shared within #SaturdaySchool, and the values and beliefs shared within #EduColor. I also compared and contrasted the findings of similar educational studies with the findings in my study. Then, I described my findings pertaining to the behaviors shared across both communities, the behaviors shared within #SaturdaySchool, and the behaviors shared within #EduColor. I also compared and contrasted the findings of similar educational studies with the findings in my study. I provided a brief summary of my findings for research question 2. Then I compared and contrasted the findings of similar educational studies with my findings for research question 2. Last, I addressed limitations of my study and proposed ideas for possible future research.

REFERENCES

About Us. (n.d). Retrieved November 5, 2018 from Resistance Manual Wiki: https://www.resistancemanual.org/About_Us

Academy of Education Arts and Science International (2012). About us. Retrieved from http://academyofeducationartsandsciences.org/index.php?option=com_content&view=article&id=53&Itemid=71

Adler, S. M., & Iorio, J. M. (2013). Progressive teachers of young children: Creating contemporary agents of change. *International Journal of Progressive Education, 9*(2), 129-143.

Apple, M. (2013). Controlling the work of teachers. In D. J. Flinders & S. J. Thornton (Eds.), *The curriculum studies reader* (pp. 157-166). New York: Routledge.

Atkinson, J., & Solar, M. (2009). Artificial intelligence and intelligent systems research in Chile. In M. Bramer (Ed), *Artificial intelligence: An international perspective* (pp. 1-10). New York: Springer.

Au, W. (2009). *Unequal by design: High-stakes testing and the standardization of inequality*. New York: Routledge.

Au, W. (2013). High-stakes testing and curriculum control: A qualitative metasynthesis. In D. J. Flinders & S. J. Thornton (Eds.), *The curriculum studies reader* (pp. 235-251). New York: Routledge.

Banks, J. A., & Banks, C. A. M. (Eds.). (2010). *Multicultural education: Issues and*

perspectives (7th ed.). Hoboken, N.J: John Wiley & Sons.

Baran, B., & Cagiltay, K. (2010). The dynamics of online communities in the activity theory framework. *Educational Technology & Society, 13*(4), 155–166.

Barragán-Ocaña, A., Quijano-Solís, A., Vega-Díaz, G., & Sánchez-Lara, B. (2012). Communities of practice: A focus from complex systems. *International Journal of General Systems, 41*(7), 741-755.

Barton, D., & Tusting, K. (2005). *Beyond communities of practice: Language, power and social context*. Cambridge, UK: Cambridge University Press.

Bernal, D. D. (2002). Critical race theory, Latino critical theory, and critical race-gendered epistemologies: Recognizing students of color as holders and creators of knowledge. *Qualitative Inquiry, 8*(1), 105-126.

Berry, K. S. (2011). Embracing radical research: A commentary on 'To the next level: Continuing the conceptualization of the bricolage'. In J. L. Kincheloe, K. Hayes, S. Steinberg, & K. Tobin (Eds.), *Key works in critical pedagogy* (pp. 279-284). Rotterdam, The Netherlands: Sense Publishers.

Bisset, S., & Potvin, L. (2006). Expanding our conceptualization of program implementation: Lessons from the genealogy of a school-based nutrition program. *Health Education Research, 22*(5), 737-746.

boyd, d. (2007). Why youth (heart) social network sites: The role of networked publics in teenage social life. In D. Buckingham (Ed.), *MacArthur Foundation series on digital learning: Youth, identity, and digital media volume* (pp. 1-26). Cambridge, MA: MIT Press.

Bray, B. (2018, October 18). Reading the world: Librarianship for the digital age and

beyond [Episode 55]. Retrieved from https://barbarabray.net/2018/10/18/reading-the-world-librarianship-for-the-digital-age-and-beyond

Bread Loaf Teacher Network (2010) Bread loaf teacher network. Retrieved from http://www.middlebury.edu/blse/bltn.

Britt, V. G., & Paulus, T. (2016). "Beyond the four walls of my building": A case study of #Edchat as a community of practice. *American Journal of Distance Education, 30*(1), 48-59.

Broussard, M. (2014, July 15). Why poor schools can't win at standardized testing. *The Atlantic*. Retrieved from http://www.theatlantic.com/education/archive/2014/07/why-poor schools-cant-win-at-standardized-testing/374287/

Bruni, A., Gherardi, S., & Parolin, L. L. (2007). Knowing in a system of fragmented knowledge. *Mind, Culture, and Activity, 14*(1-2), 83-102.

Bryant, W. H. (2006). *Whole system, whole earth: The convergence of technology and ecology in twentieth-century American culture* (Doctoral thesis) Retrieved from UMI (3225584)

Burgess, A. (2008). The literacy practices of recording achievement: How a text mediates between the local and the global. *Journal of Education Policy, 23*(1), 49-62.

Carmichael, P., Fox, A., McCormick, R., Procter, R., & Honour, L. (2006). Teachers' networks in and out of school. *Research Papers in Education, 21*(2), 217-234.

Carspecken, P. F. (1996). *Critical ethnography in educational research: A theoretical and practical guide*. New York, NY: Routledge.

Carspecken, P. F. (2012). Critical pedagogy and qualitative research: Moving toward

bricolage. In S. R. Steinbreg & G. S. Cannella (Eds.), *Critical qualitative research reader* (43-65). New York, NY: Peter Lang.

Cochran-Smith, M. (2015) Teacher communities for equity. *Kappa Delta Pi Record 51*(3), 109-113.

Cochran-Smith, M., Ell, F., Grudnoff, L., Haigh, M., Hill, M., & Ludlow, L. (2016) Initial teacher education: What does it take to put equity at the center? *Teaching and Teacher Education*, 57, 67-78.

Cochran-Smith, M., & Lytle, S. L. (2009) *Inquiry as stance: Practitioner research in the next generation.* New York, NY: Teachers College Press.

Cochran-Smith, M., Villegas, A. M., Abrams, L. W, Chavez-Moreno, L., Mills, T., & Stern, R. (2016). Research on teacher preparation: Charting the landscape of a sprawling field. In D. H. Gitomer & C. A. Bell (Eds.), *Handbook of research on teaching* (pp. 439-547), Washington DC: American Educational Research Association.

Coleman, S. (2018). Values. In H. Callan (Ed.), *The International Encyclopedia of Anthropology*. John Wiley & Sons, Ltd.

Conole, G., Galley, R., & Culver, J. (2011). Frameworks for understanding the nature of interactions, networking, and community in a social networking site for academic practice. *International Review of Research in Open and Distance Learning*, *12*(3), 119-138).

Crotty, M. (2003). *Foundations of social research: Meanings and perspectives in the research process*. Thousand Oaks, CA: Sage Publication.

Cuddapah, J. L., & Clayton, C. D. (2011). Using Wenger's communities of practice to

explore a new teacher cohort. *Journal of Teacher Education, 6*(1), 62-75.

Cypher, M., & Richardson, I. (2006). An actor-network approach to games and virtual environments. *Joint Computer Games and Interactive Entertainment Conference, 2006, 4-6 December 2006.* Perth, Australia.

Dabbagh, N., & Kitsantas, A. (2012). Personal learning environments, social media, and self regulated learning: A natural formula for connecting formal and informal learning. *Internet and Higher Education, 15*, 3-8.

Davis, K. (2015). Teachers' perceptions of Twitter for professional development. *Disability and Rehabilitation, 37*(17), 1551-1558.

Dawkins, R. (1989). *The selfish gene.* Oxford, United Kingdom: Oxford University Press.

de Groot, E., van den Berg, B. A. M., Endedijk, M. D., van Beukelen, P., & Simons, P. R. J. (2011). Critically reflective work behaviour within autonomous professionals' learning communities. *Vocations and Learning, 4*, 41-62.

Dennen, V. P. (2014). Becoming a blogger: Trajectories, norms, and activities in a community of practice. *Computers in Human Behavior, 36*, 350-358.

deNoyelles, A., Zydney, J. M., & Chen, B. (2014). Strategies for creating a community of inquiry through online asynchronous discussions. *MERLOT Journal of Online Learning and Teaching, 10*(1), 153-165.

Denzin, N. K., & Lincoln, Y. S. (Eds.). (1999). *The SAGE handbook of qualitative research* (3rd ed.). Thousand Oaks, CA: Sage Publications.

Dillenbourg, P., Järvelä, S., & Fischer, S. (2009). The evolution of research on computer

supported collaborative learning: From design to orchestration. In N. Balacheff, S. Ludvigsen, T. de Jong, A. Lazonder, S. Barnes (Eds.), *Technology-enhanced learning: Principles and products* (3-19). New York, NY: Springer.

EduColor Website, "The Work of #EduColor." (n.d.). Retrieved from http://www.educolor.org/

Edwards, R. (2011). Translating the prescribed into the enacted curriculum in college and school. *Educational Philosophy and Theory, 43*(1), 38-54.

Edwards, R., Ivanic, R., & Mannion, G. (2009). The scrumpled geographies of literacies for learning. *Discourse: Studies in the Cultural Politics of Education, 30*(4), 483-499.

Edwards, R., & Usher, R. (2007). *Globalisation and pedagogy: Space, place and identity*. London, UK: Routledge.

Emad, G., & Roth, M.-W. (2009). Policy as boundary object: A new way to look at educational policy design and implementation. *Vocations and Learning, 2*(1), 19-35.

Ennis, C. D. (1999). Creating a culturally relevant curriculum for disengaged girls. *Sports, Education and Society, 4*(1), 31-49.

Espejo, R., & Gill, A. (1989). The viable system model as a framework for understanding organizations. *Syncho Research & Dissemination on Managing Complexity*.

Espejo, R., & Reyes, A. (2011). *Organizational systems: Managing complexity with the viable system model.* New York: Springer.

Ferm Almquist, C., Nyberg, J., Gullberg, A.-K., von Wachenfeldt, T.; Mars, A., & Linn,

H. (2017). Collaborative learning as common sense; structure, roles and participation amongst doctoral students and teachers in music education: Beyond communities of practice. *Visions of Research in Music, 29*, 1-29.

Fernández, R., & Valverde, J. (2014). A community of practice: An intervention model based on computer supported collaborative learning. *Comunicar, 42*(21), 75-105.

Fenwick, T. (2011). Reading educational reform with actor network theory: Fluid spaces, otherings, and ambivalences. *Educational Philosophy and Theory, 43*(1), 114-134.

Fenwick, T., & Edwards, R. (2010). *Actor-network theory in education*. London, UK: Routledge.

Fenwick, T., & Edwards, R. (2012). *Researching education through actor-network theory*. West Sussex, UK: Wiley-Blackwell.

Fields, D. A., & Kafai, Y. B. (2009). A connective ethnography of peer knowledge sharing and diffusion in a tween virtual world. *Computer-Supported Collaborative Learning, 4*, 47-68.

Firat, M., & Yurdakul, I. K. (2011). Virtual ethnography research on *Second Life* virtual communities. *Turkish Online Journal of Distance Education, 12*(3/2), 108-117.

Fischer, R. (2018). Values. In H. Callan (Ed.), *The International Encyclopedia of Anthropology*. John Wiley & Sons, Ltd.

Fletcher, J. (2014). Social communities in a knowledge enabling organizational context: Interaction and relational engagement in a community of practice and a micro-community of knowledge. *Discourse & Communication, 8*(4), 351-369.

Gamrat, C., Zimmerman, H. T., Dudek, J., & Peck, K. (2014). Personalized workplace

learning: An exploratory study on digital badging within a teacher professional development program. *British Journal of Educational Technology, 45*(6), 1136–1148.

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2-3), 87-105.

Gee, J. P. (2005). Semiotic social spaces and affinity spaces: From *The Age of Mythology* to today's schools. In D. Barton, & K. Tusting (Eds.), *Beyond communities of practice: Language, power and social context* (214-232). Cambridge, UK: Cambridge University Press.

Giesbers, B., Rienties, B., Tempelaar, D. T., & Gijselaers, W. (2014). Why increased social presence through web videoconferencing does not automatically lead to improved learning. *E-Learning and Digital Media, 11*(1), 31-45.

Giles, C., & Hargreaves, A. (2006). The sustainability of innovative schools as learning organizations and professional learning communities during standardized reform. *Educational Administration Quarterly, 42*(1), 124-156.

Giroux, H. A. (1988). *Teachers as intellectuals: Toward a critical pedagogy of learning*. Westport, Connecticut: Bergin & Garvey.

Giroux, H., Shumway, D., Smith, P., & Sosnoski, J. (1984). The need for cultural studies: Resisting intellectuals and oppositional public spheres. *Dalhousie Review, 64*(2), 472-486.

Gisler, M., & Sornette, D. (2010). Bubbles everywhere in human affairs. *Swiss Finance Institute Research Paper Series, 10-16*, 1-21.

Gligoric, K., Anderson, A, & West, R. (2018). How constraints affect content: The case of Twitter's switch from 140 to 280 characters. *International AAAI Conference on Web and Social Media (ICWSM).*

Gorur, R. (2011). ANT on the PISA trail: Following the statistical pursuit of certainty. *Educational Philosophy and Theory, 43*(1), 76-93.

Gough, N. (2004). RhizomANTically becoming-cyborg: Performing posthuman pedagogies. *Educational Philosophy and Theory, 36*(1), 253-265.

Grady, J., Marquez, R., & McLaren, P. (2012). A critique of neoliberalism with fierceness: Queer youth of color creating dialogues of resistance. *Journal of Homosexuality, 59*(7), 982-1004.

Green, J., & Bloome, D. (1997). Ethnography and ethnographers of and in education: A situated perspective. In Flood, J., Heath, S. B., & Lapp, D. (Eds.), *Handbook of research on teaching literacy through the communicative and visual arts.* New York: Macmillan Publishers, pp. 181-202

Greenhow, C., Robelia, B., & Hughes, J. E. (2009). Learning, teaching, and scholarship in a digital age: Web 2.0 and classroom research: What path should we take now? *Educational Researcher, 38*(4), 246-259.

Groenke, S. L., & Maples, J. (2009) Small openings in cyberspace: Preparing preservice teachers to facilitate critical race talk. In S. L. Groenke, & J. A. Hatch (Eds.), *Critical pedagogy and teacher education in the neoliberal era: Small openings* (173-189), Dordrecht, NL: Springer Science + Business Media B.V.

Guba, E., & Lincoln, Y. (2005) Paradigmatic controversies, contradictions, and emerging

confluences. In: N. Denzin s& Y. Lincoln (Eds.), *The Sage handbook of qualitative research* (3rd ed.). (pp. 191–218) Thousand Oaks, CA: Sage.

Hamilton, M. (2011). Unruly practices: What a sociology of translations can offer to educational policy analysis. *Educational Philosophy and Theory, 43*(1), 55-75.

Hamilton, M., & Hillier, Y. (2007). Deliberative policy analysis: Adult literacy assessment and the politics of change. *Journal of Educational Policy, 22*(5), 573-594.

Harari, Y. (2014). *Sapien: A brief history of humankind.* Toronto: Random House of Canada.

Haraway, D. (2006) A cyborg manifesto: Science, technology, and socialist-feminism in the late 20th century. In J. Weiss, J. Nolan, J. Hunsinger, P. Trifonas (Eds.), *The international handbook of virtual learning environments* (117-158). Dordrecht, The Netherlands: Springer.

Haraway, D. J. (2008). *When species meet*. Minneapolis, MN: University of Minnesota Press.

Hardwick, C. (2016, March 26). Episode 795: Nerdist podcast: Jack Dorsey, Ev Williams and Biz Stone. *Nerdist Podcast*. Retrieved from http://nerdist.com/nerdist-podcast-jack-dorsey-ev-williams-and-biz-stone/

Hare, B., & Tomasello, M. (2005). Human-like social skills in dogs? *TRENDS in Cognitive Sciences, 9*(3), 439-444.

Hargittai, E. (2008). Whose space? Differences among users and non-users of social network sites. *Journal of Computer-Mediated Communication, 13*(1), 276-297.

Harris-Heart, C. (2009). Performing curriculum: Exploring the role of teachers and

teacher educators. *Curriculum Inquiry, 39*(1), 111-123.

Hartnell-Young, E. (2006). Teachers' roles and professional learning in communities of practice supported technology in schools. *Journal of Technology and Teacher Education, 14*(3), 461-480.

Harwood, S. A. (2009). The changing structural dynamics of the Scottish tourism industry examined using Stafford Beer's VSM. *Syst Pract Action Research, 22*, 313-343.

Hayles, N. K., (1999). *How we became posthuman: Virtual bodies in cybernetics, literature, and informatics.* Chicago, IL: The University of Chicago Press.

Hemphill, D., & Leskowitz, S. (2012). DIY activists: Communities of practice, cultural dialogism, and radical knowledge sharing. *Adult Education Quarterly, 63*(1), 57-77.

Herath, S. (2015). *Teachers as transformative intellectuals in post-conflict reconciliation: A study of Sri Lankan language teachers' identities, experiences and perceptions* (Doctoral dissertation). Retrieved from ProQuest. (3743288)

Hersey, P. A. (2012). *Supporting teachers as transformative intellectuals: Participatory action research in human rights education* (Doctoral dissertation). Retrieved from UMI. (3549767)

Hildbrand, S., & Bodhanya, S. (2015). Guidance on applying the viable system model. *Kybernete, 44*(2), 186-201.

Hine, C. (2015). *Ethnography for the Internet: Embedded, embodied, and everyday.* London: Bloomsbury.

Hui, D. (2015). Reconceptualising sustainability through computer-mediated engagement

within online professional communities of practice from teachers' perspectives. *International Journal of Continuing Engineering Education and Life-Long Learning, 25*(1), 8-27.

Hung, D., Lee, S. S., & Vishnumahanti, S. (2014). Adaptivities in teacher learning within the context of communities of practice: A school district's learning journey. In D. Hung, K. Y. I. Lim, S.-S. Lee (Eds.), *Adaptivity as a Transformative Disposition for Learning in the 21st Century* (137-155). Singapore: Springer.

Hunter, S., & Swan, E. (2007). Oscillating politics and shifting agencies: Equalities and diversity work and actor network theory. *Equal Opportunities International, 26*(5), 402-419.

Hur, J. W., & Brush, T. A. (2009). Teacher participation in online communities: Why do teachers want to participate in self-generated online communities of K–12 teachers? *Journal of Research on Technology in Education, 41*(3), 279-303.

Hur, J. W., & Hara, N. (2007). Factors cultivating sustainable online communities for K-12 teacher professional development. *Journal of Educational Computing Research, 36*(3), 245-268.

Hussenot, A. (2008). Between structuration and translation: An approach of ICT appropriation. *Journal of Organizational Change Management, 21*(3), 335-347.

Hyland, N. E., & Heuschkel, K. (2010) Fostering understanding of institutional oppression among U.S. pre-service teachers. *Teaching and Teacher Education* 26, 821-829.

Hytten, K., & Bettez, S. C. (2011). Understanding education for social justice. *Educational Foundations, 25*(1-2), 7-24.

Ivanic, R., Edwards, R., Barton, D., Martin-Jones, M., Fowler, Z., Hughes, B., … Smith, J. (2009). *Improving Learning in College: Rethinking literacies across the curriculum.* London, UK: Routledge.

Johnson, E. J., & Johnson, D. C. (2015). Language policy and bilingual education in Arizona and Washington state. *International Journal of Bilingual Education and Bilingualism, 18*(1), 92-112.

Johnson, M. W., & Leydesdorff, L. (2015). Beer's viable system model and Luhmann's communication theory: 'Organizations' from the perspective of meta-games. *Systems Research and Behavioral Science, 32*, 266-282.

Johnson, M., & Liber, O. (2008) The Personal Learning Environment and the human condition: from theory to teaching practice. *Interactive Learning Environments, 16*(1), 3-15.

Jeong, H. (2013). *Exploring the spaces of culturally relevant pedagogy: The discursive (trans)formation of the pedagogical practices of two teachers of English language learners* (Doctoral dissertation). Retrieved from UMI. (3608588)

Khalid, F., Joyes, G., Ellison, L., & Karim, A. (2013). Teachers' involvement in communities of practice: An implication with regard to the current approach of teachers' professional development in Malaysia. *Asian Social Science, 9*(16), 102-111.

Kimmons, R., & Veletsianos, G. (2016). Education scholars' evolving uses of twitter as a Conference backchannel and social commentary platform. *British Journal of Educational Technology, 47*(3), 445–464.

Kincheloe, J. L. (2005). On to the next level: Continuing the conceptualization of the

bricolage. *Qualitative Inquiry, 11*(3), 323-350.

Kincheloe, J. L., McLaren, P., & Steinberg, S. R. (2012). Critical pedagogy and qualitative research: Moving to the bricolage. In S. R. Steinbreg & G. S. Cannella (Eds.), *Critical qualitative research reader* (14-32). New York, NY: Peter Lang.

King, J. E. (2008). Critical and qualitative research in teacher education: A blues epistemology for cultural well-being and a reason for knowing. In M. Cochran-Smith, S. Fieman-Nemser, D. J. McIntyre, & K. E. Demers (Eds.), *Handbook of research on teacher education: Enduring questions in changing contexts* (pp. 1094-1133), New York: Routledge.

Kirkland, D. E. (2011). Books like clothes: Engaging young black men with reading. *Journal of Adolescent & Adult Literacy, 55*(3), 199-208.

Knox, H., Savage, M., & Harvey, P. (2006). Social networks and the study of relations: Networks as method, metaphor and form. *Economy and Society, 35*(1), 113-140.

Koerner, M. E., & Abdul-Tawwab, N. (2006). Using community as a resource for teacher education: A case study. *Equity & Excellence in Education, 39*(1). 37-46.

Kozinets, R. (2015). *Netnography: Redefined*. Los Angeles, CA: Sage.

Kulavuz-Onal, D. (2013). English language teachers' learning to teach with technology through participation in an online community of practice: A netnography of *Webheads in Action* (Unpublished doctoral dissertation). University of South Florida, Tampa, FL.

Ladson-Billings, G. (1992). But that's just good teaching! The case for culturally relevant Pedagogy. In C. A. Grant (Ed.), *Research & multi-cultural education: From the margins to the mainstream.* (pp. 59-165). London, UK: The Falmer Press.

LaGarde, J., & Whitehead, T. (2012). Power up your professional learning. *Knowledge Quest, 41*(2), 8-13.

Larrivee, B. (2000). Transforming teacher practice: Becoming the critically reflective teacher. *Reflective Practice, 1*(3), 293-307.

Latour, B. (2005). *Reassembling the social: An introduction to actor-network theory.* Oxford, UK: Oxford University Press.

Leander, K. M., & Lovvoron, J. F. (2006). Literacy networks: Following the circulation of texts, bodies, and objects in the schooling and online gaming of one youth. *Cognition and Instruction, 24*(3), 291-340.

Leonard, P., & Leonard, L. (2006) Teachers and tolerance: discriminating diversity dispositions. *The Teacher Educator 42*(1), 30-62.

Lessard, A., Butler-Kisber, L., Fortin, L., Marcotte, D., Porvin, P, & Royer, E. (2008). Shades of disengagement: High school dropouts speak out. *Social Psychology of Education, 11*(1), 25-42.

Lieberman, A., & Mace, D. P., (2010). Making practice public: Teacher learning in the 21st century. *Journal of Teacher Education, 61*(1-2), 77-88.

Liou, Y. H., Daly, A. J., Brown, C., & del Fresno, M. (2015). Foregrounding the role of relationships in reform: A social network perspective on leadership and change. *International Journal of Educational Management, 29*(2), 819-837.

Lopes Cardozo, M. T. A., Sawyer, J., & Talavera Simoni, M. L. (2015). *Machismo* and

mamitas at school: Exploring the agency of teachers for social and gender justice in Bolivian education. *European Journal of Developmental Research, 27*(4), 574-588.

Lorde, A. (2003). The master's tools will never dismantle the master's house. In R. Lewis, & S. Mills (Eds.), *Feminist postcolonial theory: A reader* (25-28). New York: NY: Routledge.

Macia, M., & Garcia, I. (2016). Informal online communities and networks as a source of teacher professional development: A review. *Teaching and Teacher Education, 55*, 291-307.

Markham, A. N. (2017). Ethnography in the digital Internet era: From fields to flows, descriptions to interventions. In N. K. Denizen & Y. S. Lincoln (Eds.), *The SAGE Handbook of Qualitative Research* (5th ed.). (pp. 650-658), Thousand Oaks, CA: SAGE.

Mayo, C. (2010). Queer lessons: Sexual and gender minorities in multicultural education. In J. A. Banks & C. A. M. Banks (Eds.), *Multicultural education: Issues and perspectives* (7th ed.). (pp. 209-227). Hoboken, N.J: John Wiley & Sons.

McCormack, C., Ambler, T., Martin, B., Waite, K., & Wilson, A. (2016). Narrative based evaluation demonstrates the value of a higher education professional learning network. *Studies in Educational Evaluation, 50*, 79-87.

McCulloh, I. A., Armstrong, H. L., & Johnson, A. N. (2013). *Social network analysis with applications.* Hoboken, N.J.: John Wiley & Sons.

McDonald, M. A. (2005). The integration of social justice in teacher education:

Dimensions of prospective teachers' opportunities to learn. *Journal of Teacher Education* 56(5), 418-435.

McEwan, N. (2008). AISI - seven years of enthusiasm: Improving learning and schools – innovation, renewal, sustainability. *Paper presented at the Annual Meeting of the American Educational Research Association March 2008,* New York, New York.

Medina, E. (2011). *Cybernetic revolutionaries: Technology and politics in Allende's Chile.* Cambridge, MA: The MIT Press.

Menken, K. (2010). NCLB and English language learners: Challenges and consequences. *Theory into Practice, 49*, 121-128.

Merriam, S. B. (2009). *Qualitative research: a guide to design and implementation*. San Francisco: Jossey-Bass.

Miller, K. H., Edwards, R., & Priestley, M. (2010). Levels and equivalence in credit and qualifications frameworks: Contrasting the prescribed and enacted curriculum in school and college. *Research Papers in Education, 25*(2), 225-243.

Millwood, R., & Powell, S. (2011). A cybernetic analysis of a university-wide curriculum innovation. *Campus-Wide Information Systems, 28*(4). 258-274.

Mlitwa, N. B. W. (2007). Technology for teaching and learning in higher education contexts: Activity theory and actor network theory analytical perspectives. *International Journal of Education and Development using Information and Communication Technology (IJEDICT), 3*(4). 54-70.

Moolenaar, N. M., Sleegers, P. J. C., & Daly, A. J. (2012). Teaming up: Linking collaboration networks, collective efficacy, and student achievement. *Teaching and Teacher Education, 28*(2), 251 – 262.

Moscovici, H. (2007). Mirror, mirrors on the wall, who is the most powerful of all? A self-study analysis of power relationships in science methods courses. *Journal of Research in Science Teaching, 44*(9), 1370-1388.

Mueller, J., & O'Connor, C. (2007). Telling and retelling about self and "others": How pre-service teacher (re)interpret privilege and disadvantage in one college classroom. *Teaching and Teacher Education* 23, 840-856.

Mulcahy, D. (2007). Managing spaces: (Re)working relations of strategy and spatiality in vocational education and training. *Studies in Continuing Education, 29*(2), 143-162.

Mulcahy, D. (2011). Assembling the 'accomplished' teacher: The performativity and politics of professional teaching standards. *Educational Philosophy and Theory, 43*(1), 94-113.

Murthy, D. (2013). Ethnographic research 2.0: The potentialities of emergent digital technologies for qualitative organizational research. *Journal of Organizational Ethnography, 2*(1), 23-36.

National Center for Education Statistics (2000). The condition of education 2000. Report for the U.S. Department of Education. Washington, DC: U.S. Government Printing Office.

National Center for Education Statistics (2014). Percentage distribution of enrollments in public elementary and secondary schools, by race/ethnicity and state or jurisdiction: Fall 2002 and fall 2012. Report for the U.S. Department of Education. Washington, DC: U.S. Government Printing Office

Nespor, J. (2011). Devices and educational change. *Educational Philosophy and Theory,*

43(1), 15-37.

Nett, B. (2008). A community of practice among tutors enabling student participation in a seminar preparation. *Computer-Supported Collaborative Learning, 3,* 53-67.

Nieto, S., & Bode, P. (2012) *Affirming diversity: The sociopolitical context of multicultural education.* Boston, MA: Pearson.

Nievera-Lozano, M. A. N. (2016). *Portraits of decolonizing praxis: How the lives of critically engaged Pinay scholars inform their work* (Doctoral dissertation). Retrieved from ProQuest. (10140271)

Nistor, N., Baltes, B., Dascalu, M., Mihaila, D., Smeaton, G., & Trausan-Matu, S. (2014). Participation in virtual academic communities of practice under the influence of technology acceptance and community factors: A learning analytics application. *Computers in Human Behavior, 34,* 339–344.

Nespor, J. (1994). *Knowledge in motion: Space, time and curriculum in undergraduate physics and management.* Bristol, PA: Falmer Press.

Nespor, J. (2002). Networks of context and reform. *Journal of Educational Change, 3*(3), 365-382.

O'Donoghue, J. (2006). *Technology supported learning and teaching: A staff perspective.* Hershey, PA: Information Science Publishing.

Organization for Economic Co-operation and Development. (2014). PISA 2012 results. Retrieved from http://www.oecd.org/pisa/keyfindings/pisa-2012-results.htm

Patton, M. Q. (1990). *Qualitative evaluation and research methods* (2nd ed.). Newbury Park, CA: SAGE Publications.

Pellerin, L. A. (2005). Disengagement and the socialization styles of high schools. *Social*

Forces, 84(2), 1159-1179.

Petersen, S. M. (2007). Mundane cyborg practice: Material aspects of broadband Internet use. *Convergence: The International Journal of Research into New Media Technologies, 13*(1), 79-91.

Pickering, A. (2002). Cybernetics and the mangle: Ashby, Beer, and Pask. *Social Studies of Science, 32*(3), 413–37.

Pickering, A. (2010). *The cybernetic brain: Sketches of another future.* Chicago, IL: The University of Chicago Press.

Pole, C. J., & Morrison, M. (2003). *Ethnography for education*. Maidenhead, UK: Open University Press.

Powell, S., Tindal, I., & Millwood, R. (2008). Personalized learning and the Ultraversity experience. *Interactive Learning Environments, 16*(1), 63-81.

Prinsen, F. R., Volman, M. L. L., & Terwel, J. (2007). Gender-related differences in computer mediated communication and computer-supported collaborative learning. *Journal of Computer Assisted Learning, 23*, 393-409.

Remesal, A., & Colomina, R. (2013). Social presence and online collaborative small group work: A socioconstructivist account. *Computers & Education, 60*, 357–367.

Resnik, J. (2006). International organizations, the ‘education-economic growth” black box, and the development of world education culture. *Comparative Education Review, 50*(2), 173-195.

Rienties, B., & Heliot, Y. (2016). Enhancing (in)formal learning ties in interdisciplinary

management courses: a quasiexperimental social network study. *Studies in Higher Education*, 1-15.

Rivera, F. D. (2007). Accounting for students' schemes in the development of a graphical process for solving polynomial inequalities in instrumented activity. *Educational Studies in Mathematics, 65*(3), 281-307.

Rogers, M. (2012). Contextualizing theories and practices of bricolage research. *The Qualitative Report, 17*(48), 1-17.

Rodesiler, L., Rami, M., Anderson, G., Minnich, C., Kelley, B., & Anderson, S. (2014). Transforming professional lives through online participation. *English Journal, 103*(6), 52-58.

Rodriquez-Vidal, J., d'Errico, F., Pacheco, F. G., Blasco, R., Rosell, J., Jennings, R. P., … Finlayson, C. (2014). A rock engraving made by Neanderthals in Gibraltar. *Proceedings of the National Academy of Sciences, 111*(37), 13301-13306.

Rohandi, R., & Zain, A. N. M. (2011). Incorporating Indonesia students' "funds of knowledge" into teaching science to sustain their interest in science. *Bulgarian Journal of Science and Education Policy (BJSEP), 5*(2), 303-322.

Salavuo, M. (2006). Open and informal online communities as forums of collaborative musical activities and learning. *British Journal of Music Education, 23*(3), 253 – 271.

Samarawickrema, G., & Stacey, E. (2007). Adopting Web-Based Learning and Teaching: A case study in higher education. *Distance Education, 28*(3), 313-333.

Sandlin, J. A. (2007). Netnography as a consumer education research tool. *International Journal of Consumer Studies, 31,* 288-294.

Sarkar, S. (2012). *The 'mover and shaker': The teacher as a holistic transformative intellectual and creative atypical deviant. A biographical case-study on Suvro Chatterjee: A contemporary Indian teacher* (Doctoral dissertation). Retrieved from UMI. (3544365)

Scheeres, H., & Solomon, N. (2006) The moving subject: Shifting work(ers) across and beyond organisational boundaries. In S. Billett, T. Fenwick, & M. Somerville (Eds.), *Work, subjectivity and learning*: *Understanding learning through working life* (87–104). Dordrecht, The Netherlands: Springer.

Schmid, E. C. (2007). Enhancing performance knowledge and self-esteem in classroom language learning: The potential of the ACTIVote component of interactive whiteboard technology. *System, 35,* 119-133.

Schrooten, M. (2012). Moving ethnography online: Researching Brazilian migrants' online togetherness. *Ethnic and Racial Studies, 35*(10), 1794-1809.

Sedeghi, S., & Ketab, S. (2009) From liberal ostrichism to transformative intellectuals: An alternative role for Iranian critical pedagogues. *ELTD, 12,* 52-60.

Shea, P., Hayes, S., Vickers, J., Gozza-Cohen, M., Uzuer, S., Mehta, R., … Ragan, P. (2010). A re-examination of the community of inquiry framework: Social network and content analysis. *Internet and Higher Education, 13,* 10-21.

Shirley, D., Hersi, A., MacDonald, E., Sanchez, C. S., Skidmore, C., & Tutwiler, P. (2006). Bringing the community back in: Change, accommodation, and contestation in a school and university partnership. *Equity & Excellence in Education, 39*(1), 27-36.

Sidorkin, A. M. (1999). The fine art of sitting on two stools: Multicultural education

between postmodernism and critical theory. *Studies in Philosophy and Education, 18,* 143-155.

Silva, L., & Mousavidin, E. (2015). Strategic thinking in virtual worlds: Studying *World of Warcraft*. *Computers in Human Behavior, 46,* 168-180.

Spalding, E., Savage, T. A., & Garcia, J. (2007) The march of remembrance and hope: Teaching and learning about diversity and social justice through the Holocaust. *Teachers College Record, 109*(6), 1423–1456.

Spector, J. M., Merrill, M. D., Elen, J., & Bishop, M. J. (Eds.). (2014). *Handbook of research on educational communications and technology.* New York, NY: Springer Press

Stinson, D. W. (2006). African American male adolescents, schooling (and mathematics): Deficiency, rejection, and achievement. *Review of Educational Research, 76*(4), 447-506.

Stokes, P. A. (2008). Some problems of liberation, *Journal of Orgaisational Transformation & Social Change, 3*(1), 5-18.

Su, N. M., Mark, G., & Sutton, S. A. (2007). Workplace connectors as facilitators for work. In C. Steinfield, B. T. Pentland, M. Ackerman, N. Contractor (Eds.), *Communities and Technologies 2007 Proceedings of the Third Communities and Technologies Conference, Michigan State University 2007* (131-150). London, UK: Springer- Verlag.

Swadener, B. B., Anquino-Sterling, C. R., Nagasawa, M., & Bartlet, M. (2009). Anti oppressive pedagogy in early childhood teacher education: A conversation. In S. L. Groenke, & Hatch JA (Eds.), *Critical pedagogy and teacher education in the*

neoliberal era: Small openings (pp. 99-112). Dordrecht, NL: Springer Science + Business Media B.V.

Teli, M., Pisanu, F., & Hakken, D. (2007). The Internet as a library of people: For a cyberethnography of online groups. *Forum: Qualitative Social Research, 8*(3), 207-231.

Tetreault, M. K. T. (2010). Classroom diversity: Rethinking curriculum and pedagogy. In J. A. Banks & C. A. M. Banks (Eds.), *Multicultural education: Issues and perspectives* (7th ed.). (pp. 159-181). Hoboken, N.J: John Wiley & Sons.

Thomas, R. (2006). Is the viable system model of organization inimical to the concept of human freedom? *Journal of Organisational Transformation & Social Change, 3*(1), 69-83.

Tilton, S. (2016). Tablet as researcher's kit: An analysis of how social scientists use tablet computers in the field. *Cogent Social Sciences, 2*, 1-12.

Tsiotakis, P., & Jimoyiannis, A. (2016). Critical factors towards analysing teachers' presence in on-line learning communities. *Internet and Higher Education, 28*, 45-58.

Ukpokodu, O. N. (2007). Fostering preservice teachers' transformative learning in a social studies methods course: A reflection of transformative pedagogy. *Social Studies Research and Practice, 2*(3), 1- 27.

U.S. Census Bureau (2008) Table 4. Projections of the population by sex, race, and Hispanic origin for the United States: 2010 to 2050. Retrieved from https://www.census.gov/population/projections/files/summary/np2008-t4.xls

U.S. Department of Education. (1999). A Nation at Risk. Retrieved from

https://www2.ed.gov/pubs/NatAtRisk/risk.html

U.S. Department of Education. (2004) NCLB / overview: Executive summary. Retrieved from http://www2.ed.gov/nclb/overview/intro/execsumm.html

Visser, R. D., Evering, L. C., & Barrett, D. E. (2014). #TwitterforTeachers: The implications of Twitter as a self-directed professional development tool for K–12 teachers. *Journal of Research on Technology in Education, 46*(4), 396-413.

Watts, M. (2009). Collaborative implementation network structures: Cultural tourism implementation in an English seaside context. *Syst Pract Action Res, 22*, 293-311.

Webb, P. T. (2006) The choreography of accountability. *Journal of Education Policy, 21*(2), 201-214.

Weiss, J. (2006). Introduction: Virtual learning and learning virtually. In J. Weiss, J. Nolan, J. Hunsinger, P. Trifonas (Eds.), *The international handbook of virtual learning environments* (1-33). Dordrecht, The Netherlands: Springer.

Wenger, E. (1998). *Communities of practice: Learning, meaning, practice*. Cambridge, UK: Cambridge University Press.

Wenger-Trayner, E., & Wenger-Trayner, B. (April 15, 2015). *Communities of practice: A brief introduction*. Retrieved from http://wenger-trayner.com/wp-content/uploads/2015/04/07-Brief-introduction-to-communities-of-practice.pdf

Wesely, P. M. (2013). Investigating the community of practice of world language educators on Twitter. *Journal of Teacher Education, 64*(4), 305-318.

Whipp, J. L. (2003) Scaffolding critical reflection in online discussions: Helping prospective teachers think deeply about field experiences in urban schools. *Journal of Teacher Education 54*(4), 321-333.

Whitehead, N. L., & Wesch, M. (Eds.). (2012). *Human no more: Digital subjectivities, unhuman subjects, and the end of anthropology*. Boulder, CO: University Press of Colorado.

Whiteman, N. (2006). *Undoing ethics: Rethinking practice in online research*. New York, NY: Springer.

Williams, B., & Hummelbrunner, R. (2009) *Systems concepts in action: A practitioner's toolkit.* Stanford, CA: University of Stanford Press.

Wong, J. L. N. (2014). How does writing for publication help professional development of teachers? A case study in China. *Journal of Education for Teaching*, *40*(1), 78-93.

Yolles, M., & Fink, G. (2011). Agencies, normative personalities and the viable system model. *Journal of Organsational Transformation & Social Change*, *8*(1), 83-116.

Young-McLear, K. C. (2015). *Designing a resilient social networking and public Participation system (SNAPPS)*. Retrieved from ProQuest. (3687714)

APPENDIX A

CONSENT FORM TO PARTICIPATE IN HUMAN SUBJECT RESEARCH

Institutional Review Board

CONSENT FORM FOR HUMAN PARTICIPANTS IN RESEARCH
UNIVERSITY OF NORTHERN COLORADO

Project Title: Using Online Communities to Prepare Teachers to Operate as Transformative Intellectuals: A Critical Ethnography

Researcher: Zachary M Clancy, Doctoral Student of Educational Studies
College of Education and Behavior Sciences
E-mail: clan4203@bears.unco.edu

Hello,

My name is Zack Clancy. I am a doctoral student at University of Northern Colorado. I am doing a research project for my dissertation. For my study, I am trying gain a better understanding of groups of teachers and activists who use social media to participate in things like Twitter chats and teach-ins over Twitter that focus on social justice issues. I am interested in learning more about these types of groups and the people who participate in them because I think that they could be a useful form of professional development for classroom teachers. I also think that teacher-education programs could use Twitter chats and teach-ins over Twitter as a way to prepare future teachers to teach all children equitably.

Regardless of whether you have only participated in a single Twitter chat and/or teach-in over Twitter, or if you participate in them on a regular basis, or are anywhere in between, YOU are qualified as long as you are either a preservice teacher, a classroom teacher, a teacher educator, or if you consider yourself an activist who participates in Twitter chats and/or teach-ins over Twitter.

If you decide to participate, I will give you a demographic survey to complete online. I will also interview you for approximately one hour over a platform such as Skype or Google Hangouts and I will be video recording our interview. I will also be collecting your tweets and replies that you have post during Twitter chats and teach-ins over Twitter in the past, as well as your tweets and replies from a Twitter chat and/or teach-in in which I will participate. Lastly, I will be collecting the comments and information related to Twitter chats and/or teach-ins that you have posted on other social media. If your social media accounts are not visible to the public, then we will likely have

to “follow” or “friend” each other over social media for the duration of my research project.

The results of your participation will be strictly confidential. A pseudonym will be used to protect your confidentiality. All responses from the demographic surveys, digital audio interview transcriptions, and my observations and reflections will be kept confidential. You will be provided with pertinent drafts of the research study to check for accuracy.

The risks inherent in this study are no greater than those normally encountered during regular classroom instruction and/or everyday use of social media.

Participation is voluntary. You may decide not to participate in this study and if you begin participation you may still decide to stop and withdraw at any time. Your decision will be respected and will not result in loss of benefits to which you are otherwise entitled. Having read the above and having had an opportunity to ask any questions, please sign below if you would like to participate in this research. A copy of this form will be given to you to retain for future reference. If you have any concerns about your selection or treatment as a research participant, please contact Sherry May, IRB Administrator, Office of Sponsored Programs, Kepner Hall, University of Northern Colorado Greeley, CO 80639; 970-351-1910.

_____

Subject’s Signature Date

_____

Researcher’s Signature Date

APPENDIX B

DEMOGRAPHIC SURVEY QUESTIONAIRE

Personal Information

Name: _____
Current city and state of residence _____
Hometown and state _____

Educational Background

Degree and Area of Study (select all that apply and specify area of study)

- ☐ Bachelors _____
- ☐ Masters _____
- ☐ Doctorate _____

Professional Experience

Grade(s) currently taught (select all that apply)

- ☐ Early Childhood Education
- ☐ Elementary
- ☐ Secondary
- ☐ Higher Education
- ☐ N/A

Grade(s) previously taught (select all that apply)

- ☐ Early Childhood Education
- ☐ Elementary
- ☐ Secondary
- ☐ Higher Education
- ☐ N/A

Content area(s) currently taught (select all that apply)

- ☐ Math
- ☐ Science
- ☐ Social Studies
- ☐ English/Language Arts
- ☐ Special Education
- ☐ Music
- ☐ Art
- ☐ Physical Education
- ☐ Higher Education (please specify)_____
- ☐ Other (please specify) _____
- ☐ N/A

Content area(s) previously taught (select all that apply)

- ☐ Math
- ☐ Science
- ☐ Social Studies
- ☐ English/Language Arts
- ☐ Special Education
- ☐ Music
- ☐ Art
- ☐ Physical Education
- ☐ Higher Education (please specify)_____
- ☐ Other (please specify) _____
- ☐ N/A

Participation in Online Community Activities

Select the type of online community activities in which you participate:

- ☐ Teach-ins, such as #SaturdaySchool
- ☐ Twitter chats such as #EduColor
- ☐ Both
- ☐ Other(s) (please specify)_____

How long have you been participating?

- ☐ Less than six months
- ☐ Six months to one year
- ☐ One year
- ☐ Two years
- ☐ Three years
- ☐ Four years
- ☐ Five or more years

How often do you participate?

- ☐ More than one time every week
- ☐ One time every week
- ☐ Two to three times every month
- ☐ One time every month
- ☐ One time every 3-6 months
- ☐ One time every 6-9 months
- ☐ One time every year
- ☐ Less than one time every year

Other than Twitter, what web sites do you use to prepare for and/or participate in teach-ins and/or Twitter chats? (select all that apply)

- ☐ Facebook
- ☐ Instagram
- ☐ LinkedIn
- ☐ Pinterest
- ☐ Other social media site(s) (please specify)_____
- ☐ Blogs
- ☐ News media websites (e.g., *New York Times*, *Washington Post*, or *Huffington Post*)
- ☐ Other(s) (please specify) _____

Use of Digital Devices

What type(s) of device(s) do you use when you participate? (select all that apply)

- ☐ Mobile phone
- ☐ Tablet computer
- ☐ Laptop computer
- ☐ Desktop computer
- ☐ Other(s) (please specify)_____

What type(s) of device(s) do you own and or use at least one time every month when you participate? (select all that apply)

- ☐ Mobile phone
- ☐ Tablet computer
- ☐ Laptop computer
- ☐ Desktop computer
- ☐ Other(s) (please specify)_____

When you use a web browser to get online, which browser(s) do you use? (Select all that apply)

- ☐ Safari
- ☐ Chrome
- ☐ Internet Explorer
- ☐ Opera
- ☐ Firefox
- ☐ Other(s) (please specify)_____

APPENDIX C

LIST OF INTERVIEW QUESTIONS

Topic Domain 1: Experience/Behavior

Lead-Off Question(s)
If I were sitting next to you as you prepared to/participated in a teach-in and/or Twitter chat, what would I see you doing?

Possible Follow-Up Questions
If they participate in both: How does preparation/participation differ for a teach-in as opposed to a Twitter chat?
How does the topic of a given teach-in and/or Twitter chat influence your preparation and/or participation?
Other than the topic of discussion, what other factors influence your preparation and/or participation?

Topic Domain 2: Knowledge

Lead-Off Question(s)
Tell me about some of the concrete reasons (e.g., events, policies, practices, facts) that you participate in teach-ins or Twitter chats?

Possible Follow-Up Questions
What kinds of information (e.g., personal anecdotes, journalistic articles, scholarly research, teacher-generated content) do you share most frequently during teach-ins and/or Twitter chats?
What kinds of information do others share most frequently?
What specific issues have you sought to address by participating in teach-ins and or Twitter chats?
In what ways have you applied the information and/or knowledge you gained as a result of participating?

Topic Domain 3: Sensory

Lead-Off Question(s)
When you are preparing for a teach-in and/or Twitter chat, what do you look for?
When you are participating in a teach-in and/or Twitter chat, what visual things catch your eye the most?

Possible Follow-Up Questions
Other than text (e.g., letters of the alphabet and numbers), what visual images stand out the most to you when participating in teach-ins and/or Twitter chats?
In what ways do you use your other senses during teach-ins and/or Twitter chats?

Topic Domain 4: Opinions/Values

Lead-Off Question(s)
What do you value about participating in teach-ins and/or Twitter chats?

Possible Follow-Up Questions

What do you see as being the greatest social contribution of teach-ins and/or Twitter chats?
What values do you see being expressed in teach-ins and/or Twitter chats?

Topic Domain 5: Feelings

Lead-Off Questions

What do you hope to accomplish and/or feel is being accomplished by participating in teach-ins and Twitter chats?

Possible Follow-Up Questions

What feelings and/or emotions do you experience when preparing for a teach-in and/or Twitter chat?
What feelings and/or emotions do you experience while participating in a teach-in and/or Twitter chat?

Topic Domain 6: Classroom Impact

Lead-Off Questions

What changes have you experienced in your classroom practices as a result of participating in #EduColor and/or #SaturdaySchool?

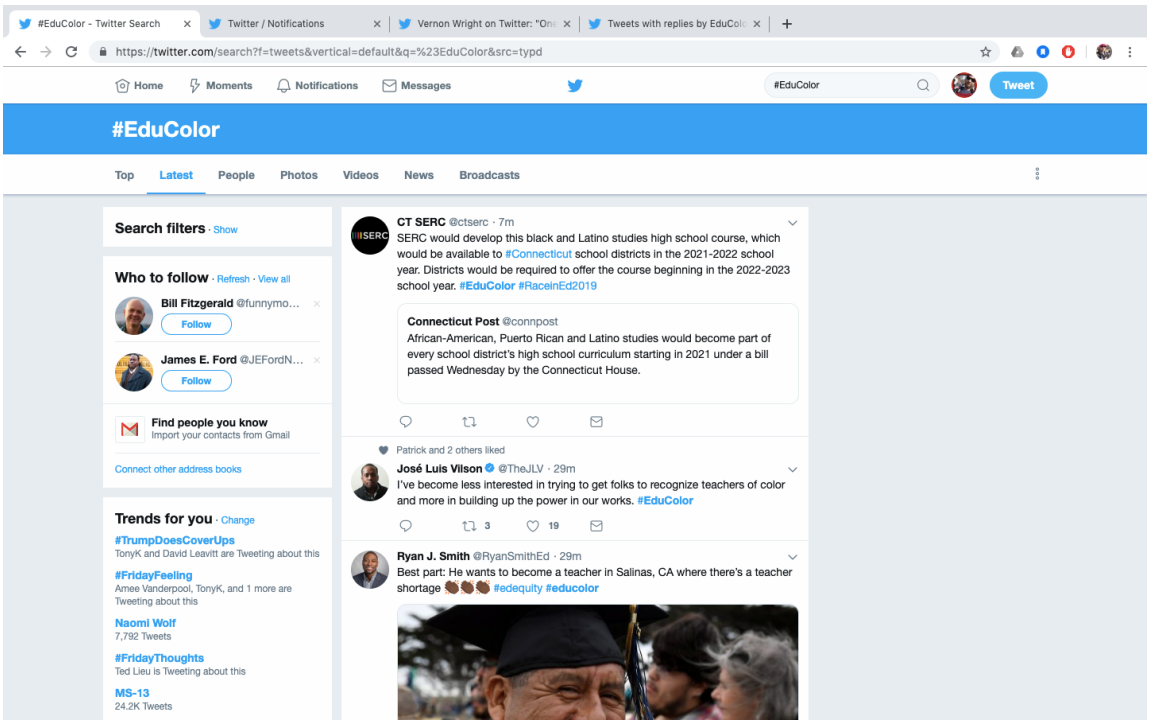
Possible Follow-Up Questions

What changes have you noticed in student language?
What changes have you noticed in student participation in class?
What other changes have you noticed?

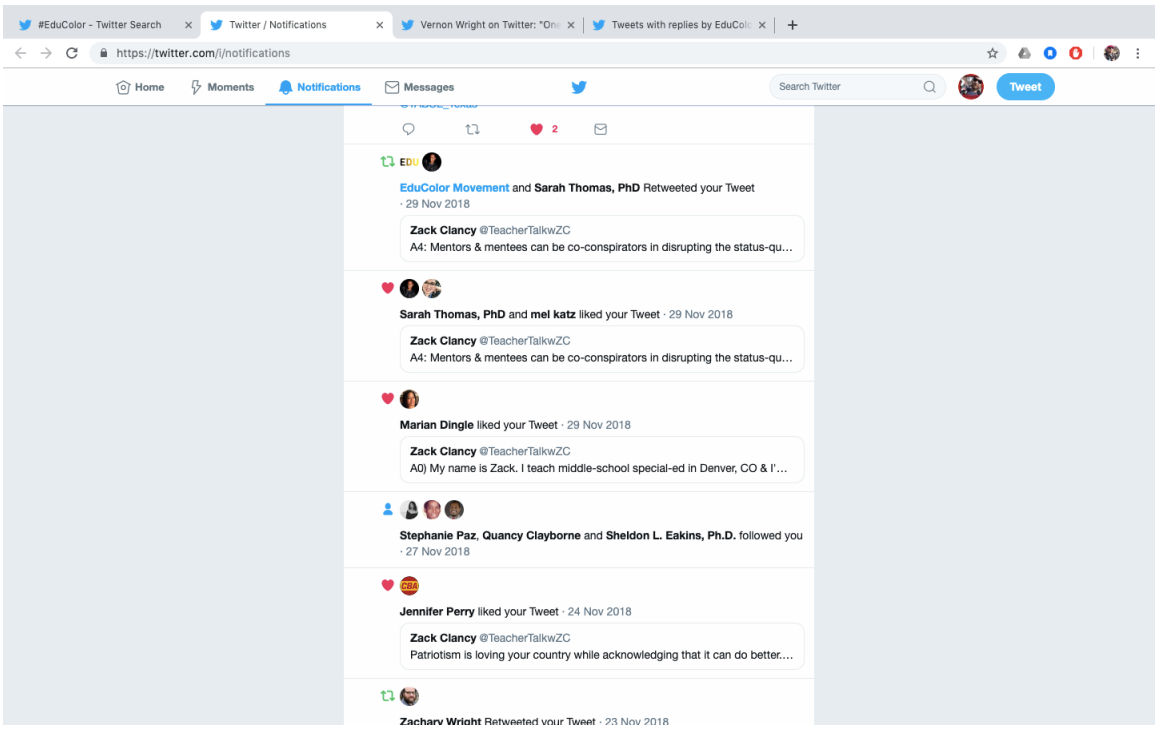
APPENDIX D

FOUR WEB-BROWSER TABS THAT PARTICIPANTS USE DURING MONTHLY #EDUCOLOR CHATS

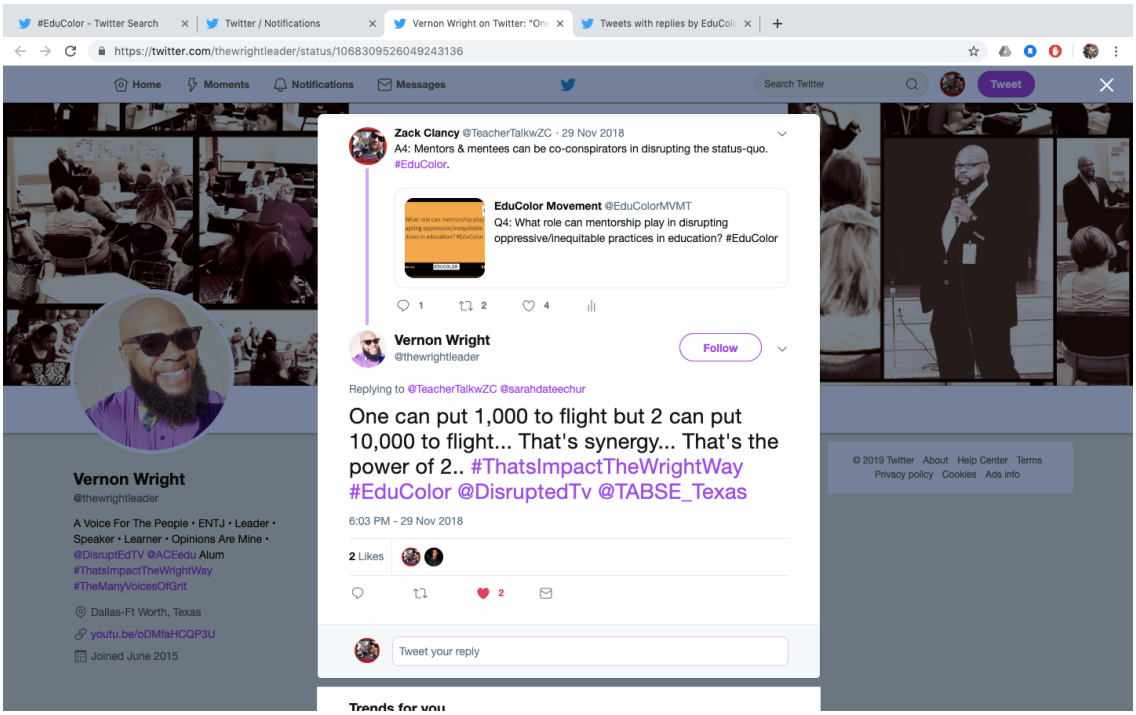
Below is a screenshot of a web-browser tab displaying most recent tweets containing the hashtag #EduColor. During a monthly Twitter chat, this tab is where participants can find the questions that moderators have posed as well as seeing other participants' responses to the moderator's questions.



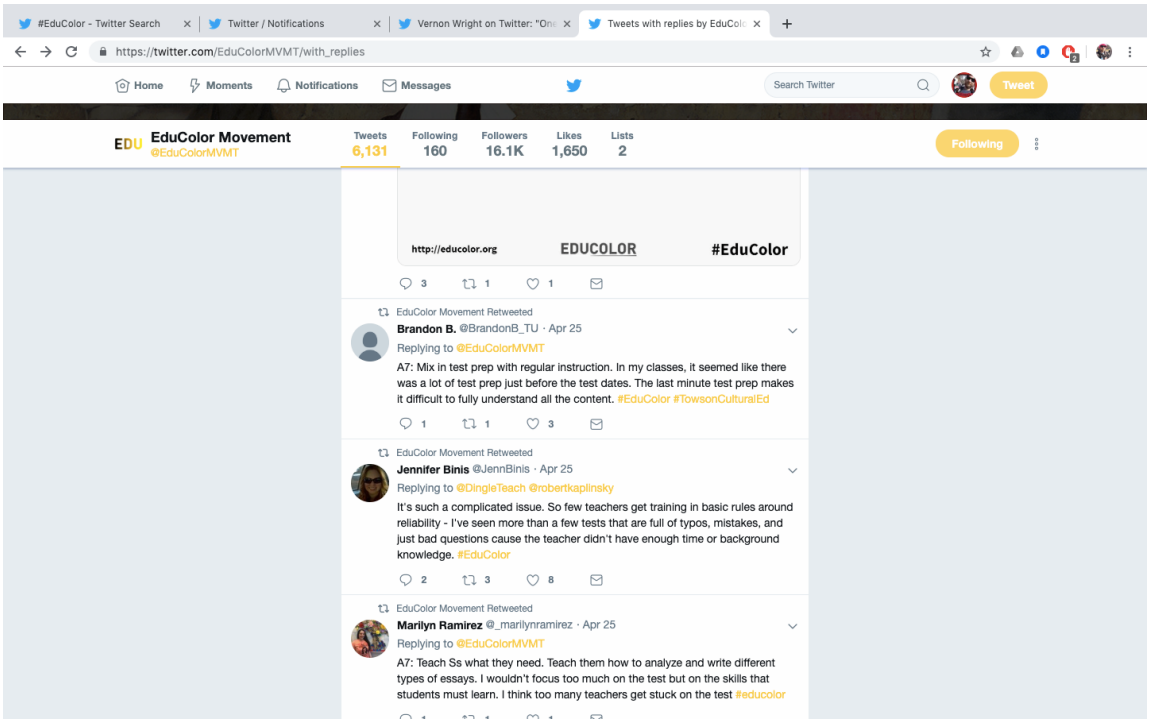
Below is a screenshot of a web-browser tab displaying some of the types of Twitter notifications that a participant sees while participating in a monthly #EduColor chat.



Below is a screenshot of a web-browser tab displaying a type of side conversation that can arise during monthly #EduColor chats. Participants report that these types of side conversations lead to on-going, reflective conversations that can continue for years and can help participants foster Twitter-based friendships with each other.



Below is a screenshot of a web-browser tab displaying the #EduColor's official Twitter profile. In addition to the #EduColor profile, during monthly #EduColor chats, participants will also sometimes have a web-browser tab open that displays the Twitter profile of the chat's moderator(s). Having web-browser tabs that displaying the aforementioned types of profiles allows a participant to view some, but not all, of the tweets pertaining the monthly chat that do not contain the hashtag #EduColor.



APPENDIX E

POSSIBLE VARIATIONS OF TWEETS CONTAINING THE HASHTAG #SATURDAYSCHOOL

Appendix E. Possible variations of tweets containing the hashtag #SaturdaySchool.

Below is a list of possible variations of tweets that existed during the time of data collection for this study. However, at time of publication. This list is no longer exhaustive. It is now possible to include a retweet within the reply to a different tweet. At the time of publication, it is also now possible to include multimedia within a retweet. This has increased the possible number of variations. Future studies must take this into consideration.

1. An original tweet without tagging another user, with a statement, with no multimedia and no resources, in which the only hashtag is #SaturdaySchool.
2. An original tweet without tagging another user, with a statement, with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
3. An original tweet without tagging another user, with a statement, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
4. An original tweet without tagging another user, with a statement, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
5. An original tweet without tagging another user, with a statement, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
6. An original tweet without tagging another user, with a statement, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
7. An original tweet without tagging another user, with a statement, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
8. An original tweet without tagging another user, with a statement, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
9. An original tweet without tagging another user, with a close-ended question, with no multimedia and no resources, in which the only hashtag is #SaturdaySchool
10. An original tweet without tagging another user, with a close-ended question, with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
11. An original tweet without tagging another user, with a close-ended question, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
12. An original tweet without tagging another user, with a close-ended question, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
13. An original tweet without tagging another user, with a close-ended question, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
14. An original tweet without tagging another user, with a close-ended question, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
15. An original tweet without tagging another user, with a close-ended question, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.

16. An original tweet without tagging another user, with a close-ended question, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
17. An original tweet without tagging another user, with an open-ended question with no multimedia and no resources, in which the only hashtag is #SaturdaySchool.
18. An original tweet without tagging another user, with an open-ended question. with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag
19. An original tweet without tagging another user, with an open-ended question, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
20. An original tweet without tagging another user, with an open-ended question, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
21. An original tweet without tagging another user, with an open-ended question, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
22. An original tweet without tagging another user, with an open-ended question, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
23. An original tweet without tagging another user, with an open-ended question, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
24. An original tweet without tagging another user, with an open-ended question, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
25. An original tweet that tags another user, with a statement, with no multimedia and no resources, in which the only hashtag is #SaturdaySchool.
26. An original tweet that tags another user, with a statement, with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
27. An original tweet that tags another user, with a statement, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
28. An original tweet that tags another user, with a statement, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
29. An original tweet that tags another user, with a statement, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
30. An original tweet that tags another use, with a statement, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
31. An original tweet that tags another user, with a statement, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
32. An original tweet that tags another user with a statement, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
33. An original tweet that tags another user, with a close-ended question, with no multimedia and no resources, in which the only hashtag is #SaturdaySchool

34. An original tweet that tags another user, with a close-ended question, with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
35. An original tweet that tags another user, with a close-ended question, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
36. An original tweet that tags another user, with a close-ended question, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
37. An original tweet that tags another user, with a close-ended question, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
38. An original tweet that tags another user, with a close-ended question, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
39. An original tweet that tags another user, with a close-ended question, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
40. An original tweet that tags another user, with a close-ended question, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
41. An original tweet that tags another user, with an open-ended question with no multimedia and no resources, in which the only hashtag is #SaturdaySchool.
42. An original tweet that tags another user, with an open-ended question. with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
43. An original tweet that tags another user, with an open-ended question, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
44. An original tweet that tags another user, with an open-ended question, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
45. An original tweet that tags another user, with an open-ended question, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
46. An original tweet that tags another user, with an open-ended question, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
47. An original tweet that tags another user, with an open-ended question, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
48. An original tweet that tags another user, with an open-ended question, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
49. Retweet without tagging another user, with a statement, in which the only hashtag is #SaturdaySchool.
50. Retweet without tagging another user, with a statement, with the hashtag #SaturdaySchool as well as another hashtag.
51. Retweet without tagging another user, with a close-ended question, in which the only hashtag is #SaturdaySchool.
52. Retweet without tagging another user, with a close-ended question, with the hashtag #SaturdaySchool as well as another hashtag.

53. Retweet without tagging another user, with a close-ended question, in which the only hashtag is #SaturdaySchool.
54. Retweet without tagging another user, with a close-ended question, with the hashtag #SaturdaySchool as well as another hashtag.
55. Retweet that tags another user, with a statement, with an open-ended question, in which the only hashtag is #SaturdaySchool.
56. Retweet that tags another user, with a statement, with an open-ended question, with the hashtag #SaturdaySchool as well as another hashtag.
57. Retweet that tags another user, with a close-ended question, in which the only hashtag is #SaturdaySchool.
58. Retweet that tags another user, with a close-ended question, with the hashtag #SaturdaySchool as well as another hashtag.
59. Retweet that tags another user, with an open-ended question, in which the only hashtag is #SaturdaySchool.
60. Retweet that tags another user, with an open-ended question, with the hashtag #SaturdaySchool as well as another hashtag.
61. A reply without tagging another user, with a statement, with no multimedia and no resources, in which the only hashtag is #SaturdaySchool.
62. A reply without tagging another user, with a statement, with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
63. A reply without tagging another user, with a statement, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
64. A reply without tagging another user, with a statement, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
65. A reply without tagging another user, with a statement, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
66. A reply without tagging another user, with a statement, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
67. A reply without tagging another user, with a statement, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
68. A reply without tagging another user, with a statement, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
69. A reply without tagging another user, with a close-ended question, with no multimedia and no resources, in which the only hashtag is #SaturdaySchool
70. A reply without tagging another user, with a close-ended question, with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
71. A reply without tagging another user, with a close-ended question, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
72. A reply without tagging another user, with a close-ended question, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
73. A reply tagging another user, with a close-ended question, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.

74. A reply without tagging another user, with a close-ended question, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
75. A reply without tagging another user, with a close-ended question, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
76. A reply without tagging another user, with a close-ended question, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
77. A reply without tagging another user, with an open-ended question with no multimedia and no resources, in which the only hashtag is #SaturdaySchool.
78. A reply without tagging another user, with an open-ended question. with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag
79. A reply without tagging another user, with an open-ended question, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
80. A reply without tagging another user, with an open-ended question, with no multimedia but with resources, with the hashtag #SaturdaySchool as well as another hashtag.
81. A reply without tagging another user, with an open-ended question, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
82. A reply without tagging another user, with an open-ended question, with multimedia but with no resources, with the hashtag #SaturdaySchool as well as another hashtag.
83. A reply without tagging another user, with an open-ended question, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
84. A reply without tagging another user, with an open-ended question, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.
85. A reply that tags another user, with a statement, with no multimedia and no resources, in which the only hashtag is #SaturdaySchool.
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93. A reply that tags another user, with a close-ended question, with no multimedia and no resources, in which the only hashtag is #SaturdaySchool

94. A reply that tags another user, with a close-ended question, with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
95. A reply that tags another user, with a close-ended question, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
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102. A reply that tags another user, with an open-ended question. with no multimedia and no resources, with the hashtag #SaturdaySchool as well as another hashtag.
103. A reply that tags another user, with an open-ended question, with no multimedia but with resources, in which the only hashtag is #SaturdaySchool.
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105. A reply that tags another user, with an open-ended question, with multimedia but with no resources, in which the only hashtag is #SaturdaySchool.
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107. A reply that tags another user, with an open-ended question, with multimedia and with resources, in which the only hashtag is #SaturdaySchool.
108. A reply that tags another user, with an open-ended question, with multimedia and with resources, with the hashtag #SaturdaySchool as well as another hashtag.

APPENDIX F

INSTITUTIONAL REVIEW BOARD APPROVAL LETTER

Appendix F. Institutional Review Board approval letter

UNIVERSITY OF NORTHERN COLORADO

Institutional Review Board

DATE:	June 14, 2017
TO:	Zachary Clancy
FROM:	University of Northern Colorado (UNCO) IRB
PROJECT TITLE:	[1069677-3] Using Online Communities to Prepare Teachers to Operate as Transformative Intellectuals: A Critical Ethnography
SUBMISSION TYPE:	Amendment/Modification
ACTION:	APPROVED
APPROVAL DATE:	June 14, 2017
EXPIRATION DATE:	June 14, 2018
REVIEW TYPE:	Expedited Review

Thank you for your submission of Amendment/Modification materials for this project. The University of Northern Colorado (UNCO) IRB has APPROVED your submission. All research must be conducted in accordance with this approved submission.

This submission has received Expedited Review based on applicable federal regulations.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by this committee prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to this office.

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to this office.

Based on the risks, this project requires continuing review by this committee on an annual basis. Please use the appropriate forms for this procedure. Your documentation for continuing review must be received with sufficient time for review and continued approval before the expiration date of June 14, 2018.

Please note that all research records must be retained for a minimum of three years after the completion of the project.

If you have any questions, please contact Sherry May at 970-351-1910 or Sherry.May@unco.edu. Please include your project title and reference number in all correspondence with this committee.

Hello Zachery,

I am the second and final reviewer of your IRB application. Everything looks good and I am approving your application. You will need to reset the initialing of your Consent as it is now off. Good luck with this research.

Sincerely,

Nancy White, PhD, IRB Co-Chair

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Northern Colorado (UNCO) IRB's records.